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AMERICA'S WWII GHOST ARMY

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# HISTORY OF MEDICINE

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# WELCOME FEBRUARY 2021

Bloodletting was just one of the many methods our ancestors used to cure common maladies

This month, as millions of people across the globe receive – or prepare to receive – a vaccination against Covid-19, **we embark on a journey through the history of medicine**, exploring how our ancestors coped with deadly diseases like plague, typhoid and cholera, and charting the great leaps in medical knowledge that have brought us to where we are today. Our essential guide begins in ancient times, when the theory of the four humours ruled supreme and ends with the many monumental medical breakthroughs of the 20th century. Turn to page 26 to get started.

Elsewhere, **we take a closer look at the 23rd Headquarters Special Troops**, a mobile, multimedia, tactical deception unit that used an array of innovative methods – from deploying inflatable tanks to broadcasting fake radio transmissions – to fool the Nazis in the final year of World War II (*page 58*).

We also **explore the fascinating, albeit often forgotten, life of 16th-century Irish pirate queen Grace O'Malley,** whose exploits at sea and on land brought her face to face with Queen Elizabeth I (*page 65*) and **find out why, in the 19th century, thousands of Mormons left their homes** in Illinois to seek out new lives further west (*page 16*). And we ask how history might have been different **had Roman dictator Julius Caesar not been assassinated** by a group of Roman senators in 44 BC (*page 70*). As ever, we also answer a host of historical conundrums on a range of topics – **from votes for women, to how St Bernard dogs got their name** (*page 73*).

Finally, don't forget to take advantage of **this month's great subscription offer, which could see you benefit from 50 per cent off the shop price!** More details on page 24.

Until next month, stay safe.

**Charlotte Hodgman**
Editor

## THIS MONTH'S BIG NUMBERS

**1996**
The year that the secret activities of the WWII Ghost Army were finally declassified

**200m**
The number of lives estimated to have been saved by penicillin

**60**
The number of senators who played a role in the assassination of Julius Caesar in 44 BC

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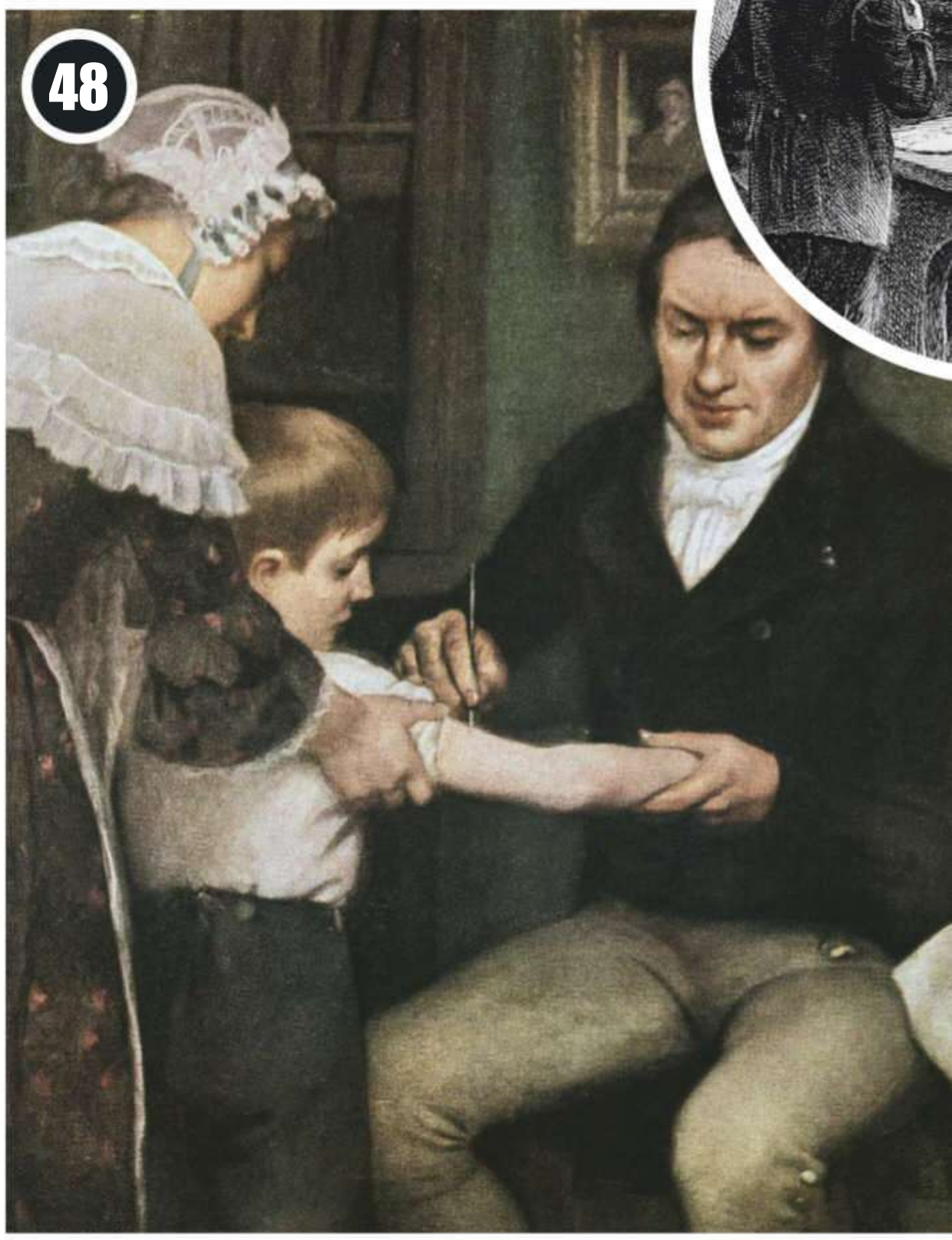


▲ When it came to tackling the scourge of smallpox, physicians such as Edward Jenner really got to the point

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SNAPSHOTS

# 1965 DANCE OF THE DRAGONS

The streets of Chinatown in Manhattan, New York, burst into life to celebrate Chinese New Year in 1965 – the year of the snake. The community is one of the oldest and largest Chinese ethnic enclaves outside of Asia in the world, and can be traced back to the first Chinese immigrants to arrive in the US, in the 1850s. Chinese New Year festivities would not be complete without the dragon dance, a symbol of power and good luck.

GETTY IMAGES

SNAPSHOTS

# 1950s MODERN MIRACLE

This year will see people all over the world receive a vaccination against Covid-19. But in the 1950s, another race to bring a devastating global disease under control was underway: polio, an infectious disease that especially affects children, causes spinal and respiratory paralysis and has no cure.

Polio cases peaked in the mid-20th century, with the US recording 57,628 cases in 1952 alone. And yet within 10 years the disease had nearly been entirely eradicated thanks to the creation of polio vaccines – the first of which was developed by American virologist Dr Jonas Salk – and subsequent mass vaccination programmes. This young girl puts on a brave face as she receives her polio jab – seemingly unconvinced by the poster promising her that "This is fun!"

GETTY IMAGES

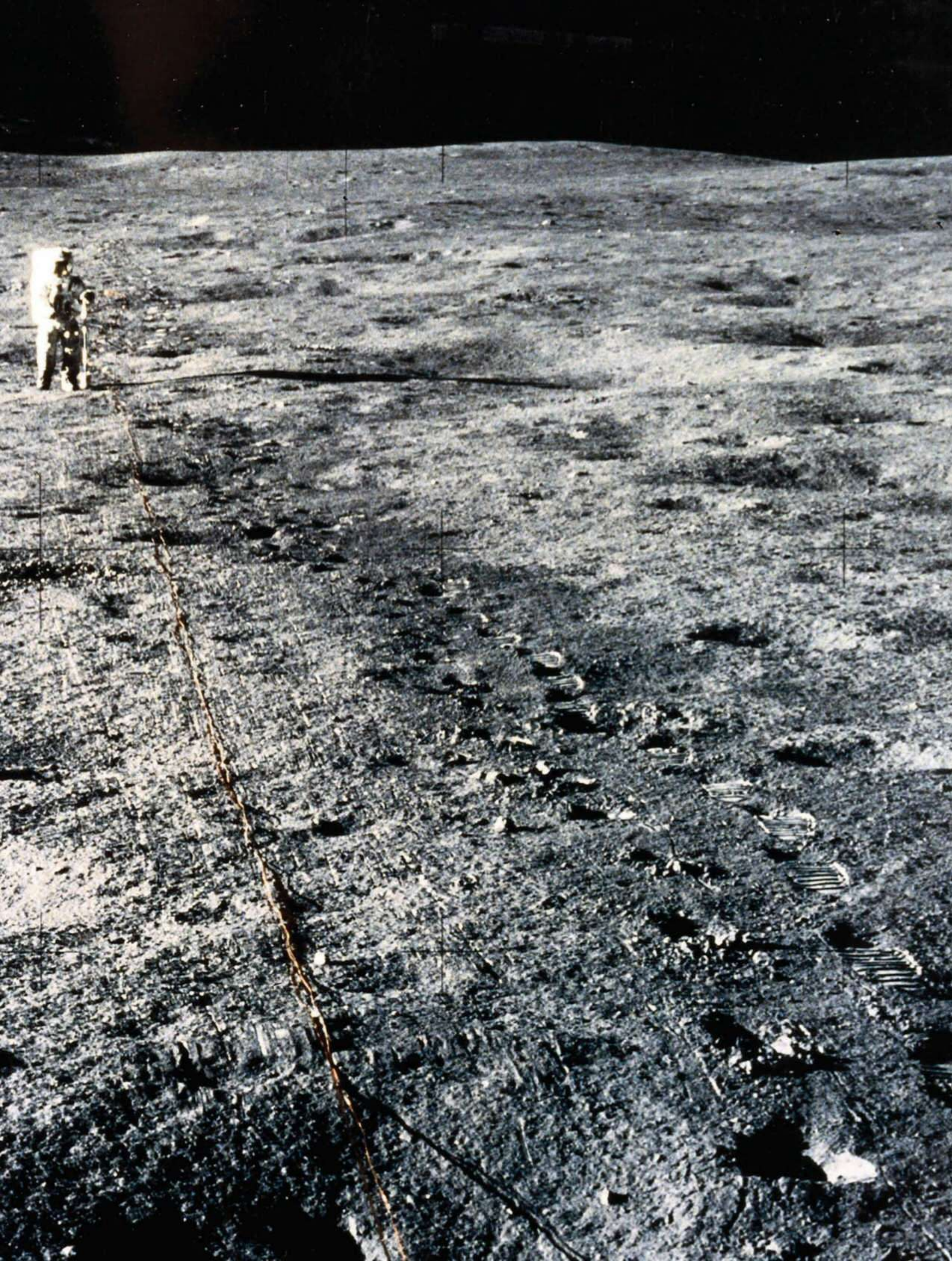
THIS IS FUN!
A PUBLIC SERVICE

SNAPSHOTS

# 1971
# SPACE INVADERS

US astronaut Edgar Mitchell becomes the sixth person to walk on the surface of the Moon as the Lunar Module Pilot of Apollo 14. Landing on 5 February 1971 – on the site intended for the failed Apollo 13 mission – Mitchell and Alan Shepard collected more than 40kg of Moon rock, while Shepard even found time to hit a couple of golf balls from the lunar surface. Stuart Roosa, Command Module Pilot, had brought hundreds of tree seeds with him aboard Apollo 14; these were germinated and planted throughout the US and the rest of the world when the crew returned to Earth, becoming known as 'Moon trees'.

GETTY IMAGES



# THINGS WE LEARNED THIS MONTH....

## RECENT HISTORY HEADLINES THAT CAUGHT OUR EYE

### MOSAIC SHOWS BRITAIN STILL FLOURISHED AFTER ROMANS LEFT

A 5th century mosaic has been discovered at a National Trust property in Gloucestershire the first mosaic of that era ever found in Britain. The ornate floor decoration, unearthed at Chedworth Roman Villa, is being hailed by experts as "tremendously exciting" because it was created after Britain ceased to be a part of the Roman empire in AD 410. Whereas it was previously thought that all Roman villas were abandoned following an economic crash during the 4th century, the mosaic's age determined using radiocarbon dating suggests that high society was still flourishing long afterwards.

NATIONAL TRUST-BARRY BATCHELOR X1, NATIONAL TRUST-MIKE CALNAN X1, NATIONAL TRUST-JAMES DOBSON X1, HIGHWAYS ENGLAND X1, NATIONAL MUSEUM OF NAMIBIA X1, UNIVERSITY OF ABERDEEN X2, ALAMY X1

## HAUL OF FINDS UNEARTHED IN HULL

A wealth of archaeological discoveries have been made in Hull ahead of a major road improvement scheme in the city centre. Preliminary excavations made as part of the A63 Castle Street revamp have so far revealed the outlines of two medieval buildings, timbers from a World War II bomb site and several portions of Hull New Gaol, which was in use for more than 40 years from 1785. The project has also involved the exhumation of bodies from the former Trinity Burial Ground, where archaeologists found an array of decorative items including the pipe bowl shown below.

## CIGAR BOX SOLVES PYRAMID MYSTERY

A missing artefact from Egypt's Great Pyramid has turned up in Scotland. The 5,000 year old fragment of cedar wood, originally discovered by engineer Waynman Dixon in 1872, was donated to the University of Aberdeen in the 1940s before later going missing. It was only recently when curatorial assistant Abeer Eladany (*pictured left*) was reviewing items in the university's Asia collection that the artefact was discovered inside a cigar box that had been misplaced. The only other items to have been found within the pyramid a dolerite ball and copper hook are held by the British Museum.

## SHIPWRECK REVEALS IVORY TRADE IMPACT

A huge haul of elephant tusks found among the wreckage of a 16th century trading vessel offers new clues about the destructive legacy of the African ivory trade, say scientists. The cargo, which sank along with the Portuguese ship *Bom Jesus* in 1533, was discovered off the coast of Namibia in 2008 along with 40 tonnes of gold and silver coins. Following recent DNA analysis, researchers have now discovered that the tusks came from 17 distinct herds of West African forest elephants. In contrast, modern genetic data shows that the descendants of just four of these herds still survive today.

**47,000**

finds were reported to the British Museum's Portable Antiquities Scheme in 2020, with a sharp rise in the number of discoveries made in back gardens during the first 'full' Covid-19 lockdown

## NIGHTINGALE MUSEUM FACES CLOSURE

The Florence Nightingale Museum in London could be closed permanently due to the Covid 19 pandemic. The museum, based at St Thomas' Hospital, has been shut since November and staff redundancies are looking likely. It has been announced that, regardless of any restrictions easing, from 28 February the museum will close for the foreseeable future. In March 2020, the museum launched an exhibition celebrating the bicentenary of Florence Nightingale's birth but the display was only open for 10 days before a national lockdown forced it to close its doors.

**“Family history is more than just names and dates... it leads to a greater understanding of history in general”**

MAIN: Gill Blanchard outside Caistor Hall Hotel in Norfolk, which she researched at the request of the owners

BELOW: Gold-medal winning Paralympian runner Jonnie Peacock is assisted by Gill’s research on his family history journey for BBC television show, *Who Do You Think You Are?*

GILL BLANCHARD X3

# Genealogist and house historian

Gill Blanchard

**HOW DID YOU GET INTO GENEALOGY?**
I first became interested in genealogy as a teenager when some Australian relatives made contact while tracing their family history. As long as I can remember, I have had an interest in local and social history and this came to the fore even when I studied history at degree level. To me, family and house history encapsulate, at a micro level, social and local history. They are about people and places. Family history, in particular, is more than just names and dates; learning about our ancestors' lives and putting them in context leads to a greater understanding of history in general.

While I was completing my MA, I worked as an archive assistant at a local record office, where I undertook research, cataloguing and assisted the public with enquiries. After working there for six years, I decided I loved the research side so much that I wanted to work for myself and teach others, so I undertook a training course for teaching adults and launched my business as a genealogist and house historian.

**WHAT ARE THE FIRST STEPS WHEN BEGINNING A FAMILY HISTORY ENQUIRY?**
I review all the information I have been given and make my research plan. This includes notes on what aspects might need checking and which records to look at and where. I like to see copies of any documentation they have, such as birth, marriage and death certificates. While a lot of material is online, there is still a great deal that can only be accessed at a record office.

If the person making the enquiry has already gone back into the late 19th century themselves, I will begin by looking for births, marriages and deaths and search census returns. I follow this by searching parish registers, which are a major core of family history research, especially before 1837. I check for any wills and sources such as workhouse or parish poor law records for the area in which they lived.

**WHAT RECORDS IN BRITAIN ARE INVALUABLE TO GENEALOGISTS?**
The core records for family history research in Britain are the civil birth, marriage and death registrations that began in July 1837; Anglican parish registers, which can potentially go back to 1538; and probate records, workhouse, parish poor law and nonconformist records. There are other useful sources, of course, but the ones that might be useful will depend on the location, gender, social class, occupation and personal circumstance of the ancestor in question. The key to any investigation is knowing what the sources might tell you and how that could help your research.

As well as research, Gill gives talks and runs workshops

**WHAT ARE THE BEST AND WORST PARTS OF YOUR JOB?**
Recently, the Covid 19 pandemic has meant having limited access to record offices and their collections due to social distancing rules. It makes completing work quite challenging, but it won't last forever. In general, I can't think of any downsides to my work other than dealing with bad weather when inspecting the exterior of a house or looking for gravestones in a cemetery or churchyard.

The best parts are making discoveries and putting the pieces together for someone. I never get tired of research. One of my specialisms is writing family histories and house histories and putting them in bespoke books for clients. It is such a thrill to present a finished written history to someone.

**HAVE YOU UNEARTHED ANY INTERESTING STORIES FROM YOUR OWN FAMILY HISTORY?**
There were ancestors on my mother's side involved in the Irish Civil War, in the 1920s, and a cousin of my grandfather survived the sinking of *Titanic*.

**WHERE SHOULD BUDDING FAMILY HISTORIANS START THEIR SEARCH?**
You should check out what is available at the county record office, as the vast majority of sources are held locally. Join a family history society and/or the Society of Genealogists. These hold indexes and transcripts to many local records and, in some cases, copies of original records. You will find a wealth of knowledge among their members.

When it comes to research, collect as much information and copies of documents as possible from relatives. Follow up by searching for births, deaths and marriages, as these are the building blocks of family history research. For example, an English and Welsh marriage certificate will include the names of the fathers of the bride and groom (unless illegitimate) and Scottish certificates include the names of both parents. You should look at the 1939 Register, which listed the civilian population in that year and can be accessed online on *Ancestry* and *Findmypast*. The census returns from 1841 to 1911 are also available online.

Going back in time, you will need to look at Anglican parish registers of baptisms, marriages and burials held in county record offices. Many have been digitised and are online, but not all, so it is essential to check what a record office holds. As well as taking you further back in time, you can use them to fill in information about siblings in a family. Don't forget to record the sources you have used and the information found. And most of all, have fun!

**GILL BLANCHARD** is a historical researcher, whose books include *Writing Your Family History* (Pen & Sword, 2014). Visit *pastsearch.co.uk for* more information about her work. Gill is also a regular contributor to *Who Do You Think You Are? Magazine,* which, like *BBC History Revealed*, is published by Immediate Media Company Limited

# THE GREAT MORMON MIGRATION

Words: Rhiannon Davies

INSET: **Mormon prophet Brigham Young (*second left*), who led the exodus from Nauvoo, pictured with his brothers in 1866**
MAIN: **A 19th-century painting shows the conditions that the Mormon travellers endured while crossing the frozen Mississippi**

In the icy grip of winter, a thin line of wagons set out from Nauvoo, Illinois, and crossed the Mississippi River, laden with passengers and provisions. Those inside belonged to the Church of Jesus Christ of Latter day Saints (otherwise known as the Mormons), and they were fleeing their city in search of a new home. They were headed for the west.

Somewhere in that great untamed wilderness, they were sure, they would find a better future: a place to build a new city, which they hoped would be free of the dangers that had dragged Nauvoo into violence and despair.

This wasn't the first time that the Mormons had been pushed to abandon their homes in search of a fresh start. Since Joseph Smith had proclaimed himself to be a prophet of God in 1830 and preached from his *Book of Mormon*, his followers had been hounded. Their lifestyle particularly the practice of polygamy, and their steadfast refusal to keep slaves deeply worried their Christian neighbours.

## THE GREAT UNKNOWN

Forced out of their original home of Missouri in 1839 after an outbreak of armed fights, 15,000 Mormons settled in what would become known as Nauvoo, in Illinois. Smith's followers had flocked to the settlement, and by 1845, it had ballooned to become arguably the biggest city in the state. But the same fate befell them here, too, as anti Mormon prejudice again bubbled over into violence. An enraged mob torched the homes of Mormons and murdered Smith and his brother, Hyrum, in 1844. It was clear that the Mormons had to leave of their own accord, before the situation became even more serious.

> "Young saw the opportunity for the Mormons to make a home for themselves where they wouldn't be uprooted"

Brigham Young, the president of the Quorum of the Twelve Apostles (a group that helped govern the Mormons) and leader of the church following Smith's untimely death, declared that the Mormons should ultimately leave the United States behind for good. In the wilds of the west, Young saw the opportunity for the Mormons to make a home for themselves where they wouldn't be uprooted by persecution from their fellow Americans. And God was on his side, Young believed: "It is the mind of the Spirit to the Saints scattered abroad throughout this Continent to gather Westward, to the place appointed, for... a home to Israel."

The only problem in this grand plan

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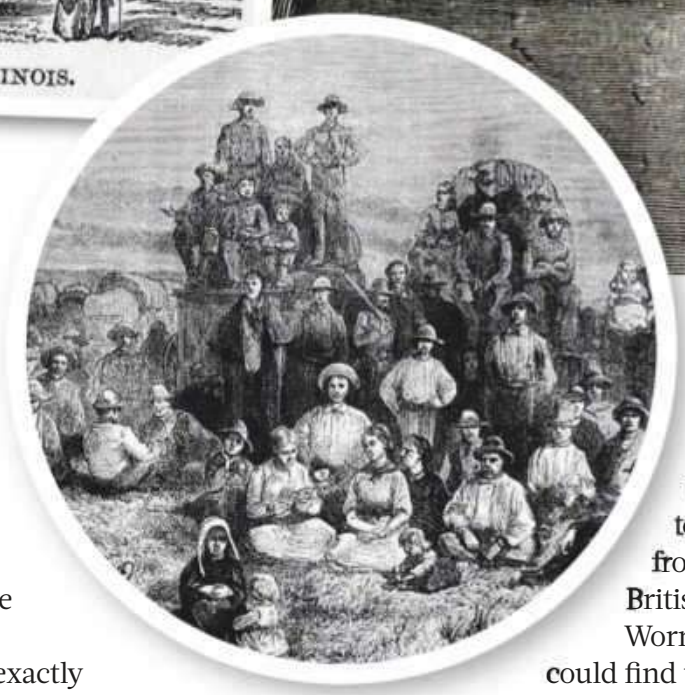
The Mormons' temple in Nauvoo was unfinished when they were forced to flee the city in early 1846

MORMON TEMPLE AT NAUVOO, ILLINOIS.



INSET: **A Mormon desert encampment, depicted around the time of the original great migration in 1846**

MAIN: **Wagon trains would sometimes encounter Native American tribes during their travels west**

was that Young didn't know where this new colony would be. He was unfamiliar with the western lands and didn't pick any set destination, only being firm that it had to be a place where they would "infringe upon no one, and [were] not be likely to be infringed upon".

But despite not knowing exactly where they were going, the Mormons pressed ahead with their plans to flee Nauvoo and venture west in search of their new home. For this purpose, wagons were built at breakneck speed. According to one resident of Nauvoo: "Nearly every man was some kind of a mechanic to build wagons, and the whole mind of the people was engaged in the great work of emigrating west in the spring". Even the great Mormon temple, which they had been constructing since they had settled in Nauvoo, was turned to their efforts: "Nearly every workshop in the city had been converted into a wagon maker's shop. Even an unfinished portion of the Temple is thus used."

## GOING WITH THE FLOE

By the end of 1845, at least 2,000 wagons were roadworthy or required only finishing touches, and 3,000 families had readied themselves for the journey that lay ahead. And it couldn't come quickly enough. Anti-Mormon prejudice had hit fever pitch. In January, Nauvoo's city charter had been revoked by the state; in September, mobs had started razing settlements near the city to the ground; and the following month, "anti-Mormons" passed the Quincy Convention, which called for Mormons to depart the area before May 1846. But the final push came in February 1846, when rumours abounded that the US army might arrive to forcibly stop the Mormons from moving into Indian, British or Mexican territory.

Worried that the Mormons could find themselves stuck in Nauvoo, Young called for the exodus to begin immediately. Most of the church leaders would leave first, with the majority of Mormons following in their footsteps later in the season, when the weather would be better suited for travelling.

On 4 February 1846, the first wagons rolled out. This advance company crossed the Mississippi River and set up a camp at Sugar Creek, which was around nine miles from Nauvoo. Over the coming month, many more braved the freezing temperatures and started to depart the city, but their journey was far from easy. Amasa Lyman, who left Nauvoo on 23 February, wrote: "Found the ice running the river, so it was impossible to cross that night except in a skiff, which I succeeded in doing with great difficulty." As well as getting themselves to safety, the unlucky travellers also had to transport their wagons, goods and animals across the treacherous waterway.

And once they had crossed the river, their troubles were far from over. At Sugar Creek, the Mormon leaders were split by indecision over where to go next. Bishop George Miller wrote: "While we camped on Sugar Creek there was hardly a night without a council, and quite as many changes of plans as councils... We had repeated delays, from causes that I could not understand." At the time, the roads that led to the west in Iowa were few and far between, and those that did exist were plagued with problems – so transporting hundreds of wagons along them would be no easy feat.

While the leaders debated their next course of action, more and more Mormons streamed into the camp at Sugar Creek; in total, over 2,000 gathered there that month alone. Eventually, a way forward was agreed upon. If the next leg of their journey went as it should, they would be standing on the banks of the Missouri River by mid-April. From there, they'd traverse the Rocky Mountains before heading into the west.

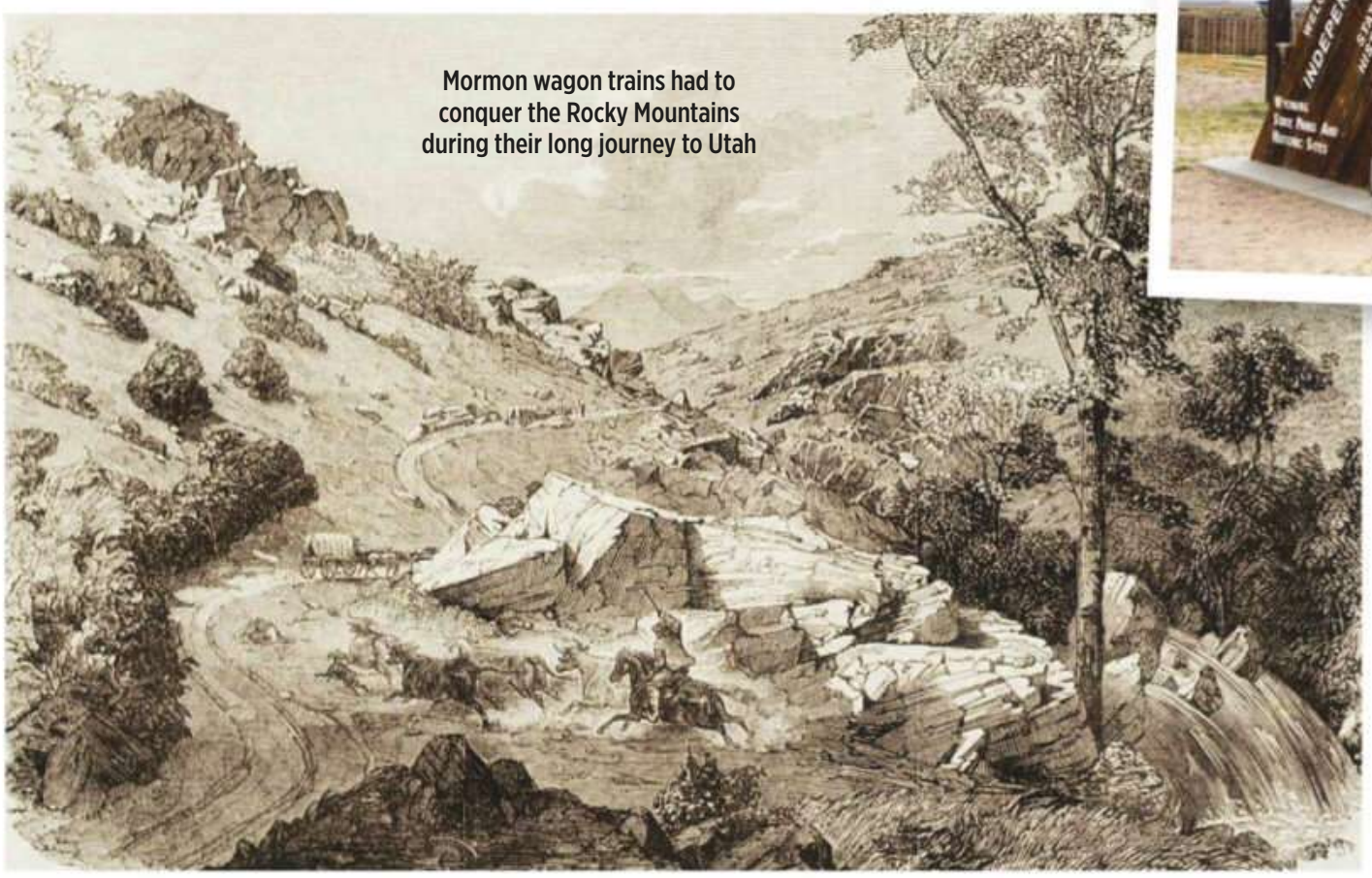
## A SILVER SERPENT

On 1 March the "Camp of Israel" rolled out of Sugar Creek and began heading for the waterway. But soon they realised their plan to reach the river in six weeks' time was nothing more than a pipe dream. Terrible weather cursed the Mormons, who had to battle through freezing temperatures and were pelted by snow and rain. When the sun's feeble rays thawed the ice, the ground underfoot became "one mud hole", with wagons regularly getting stuck. From mid-March to mid-April, the storms hampered their progress so much that the camp moved less than half a mile per day.

To make matters worse, many of the Mormons hadn't brought enough supplies to sustain them for the journey. This was a logistical headache. Those whose provisions weren't up to par were forced to find work in farms along the way to earn money for supplies, hampering the camp's progress, or

# THIS MONTH... 1846

## ANNIVERSARIES THAT HAVE MADE HISTORY



Mormon wagon trains had to conquer the Rocky Mountains during their long journey to Utah

Independence Rock got its name because emigrants heading west on the Oregon Trail in spring would hope to reach it by 4 July

else borrow food from other Mormons, which caused their stocks to run low. One of the travellers, Helen Mar Kimball Whitney, wrote: "My father in speaking of it [the food shortages] said, under the circumstances, it would take years to reach the mountains."

Thankfully, the 327-mile journey to the Missouri River didn't take years, as Whitney's father had predicted, but it did take far longer than the Mormons had originally believed. On 14 June 1846 two months later than planned the camp finally saw the waterway "sprawled like a silver serpent in the sun".

As they'd reached the river so late in the season, they couldn't cross the Rocky Mountains that year. Instead, the camp needed to find somewhere they could spend the winter in safety, where they could plant precious crops and prepare for the journey ahead of them.

### WINTER WORRIES

Young had always planned for at least some of the travelling party to spend the winter in camps dotted along Iowa, by the Missouri River or at Grand Island, Nebraska, as only an advance camp would have attempted to go "over the mountains" before the autumn. Now, the whole main camp would spend the winter on the eastern side of the Rockies. But where could they stay?

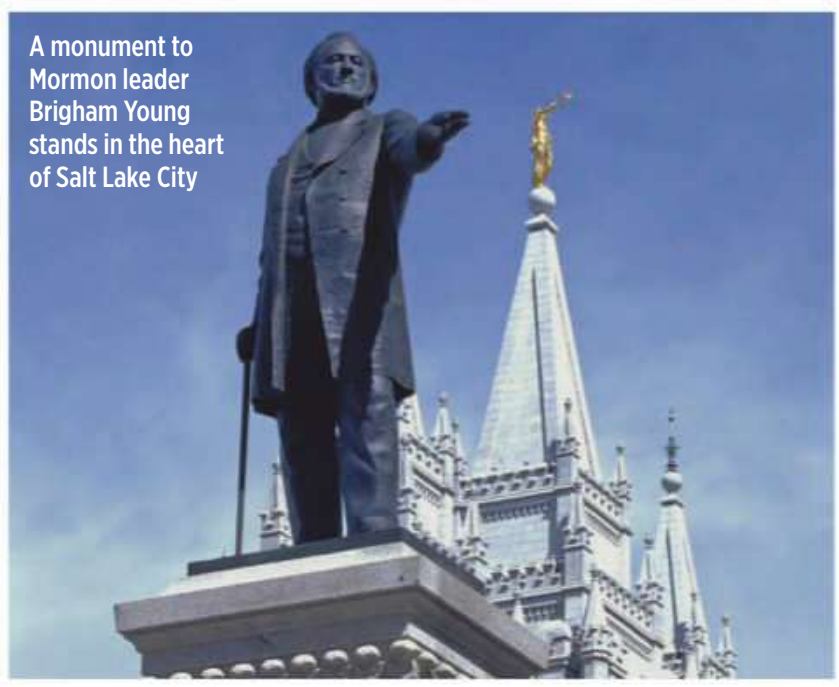
The Mormons settled on a portion of land on the Missouri's western bank (today Florence, Nebraska) as the best place to create a temporary encampment known as 'Winter Quarters'. Although they were in Native American territory, the indigenous people who lived in the area seemed to accept their presence but Young did warn the Mormons to "have nothing to do with the Pottawattamies", as he was deeply fearful of angering them and bringing their goodwill to an end.

> "Sometimes the sickness in the camp was so great that there weren't enough healthy men to bury the corpses"

By December, it's estimated that almost 4,000 Mormons were settled in Winter Quarters, with many others sheltering in temporary camps spread across Iowa. The town became a hub of preparations for the journey ahead, as well as a place of religious regeneration. At the same time that plans for the next leg of the journey were finalised, women were accepted as priests, and polygamy was practiced without fear of retribution. But the winter wasn't without tragedy. Many of the houses at Winter Quarters were ramshackle, being little more than shanties lacking proper roofs or doors; some Mormons lacked even that and were forced to sleep in caves or tents. Exposure and malnutrition claimed the lives of many, with scurvy alone killing up to 15 per cent of the camp; sometimes the sickness was so great that there weren't enough healthy men to bury the dead. And, of course, there was still hundreds of miles of unknown territory to traverse when spring came.

In the early days of April 1847, the Mormons left Winter Quarters in search of "the Bear River Valley, Great Basin, or Salt Lake [in Utah]". The advance party – 25 wagons, commanded by Young – rolled out from their temporary refuge to traverse the Rocky Mountains. Afraid to take the Oregon Trail, where they could encounter other travellers who would likely harbour anti Mormon sentiments, they forged a new path along the north bank of the Platte River.

Crossing to the river's south side at Fort Laramie, Wyoming, they had passed the halfway point of their epic journey. As the terrain became too tough from here on out to try and forge their own trail, the risk of meeting other travellers seemed one they had to take, and they opted to travel along the Oregon Trail. This proved to be the right decision, and they made good progress, moving along the trail by day and whiling away the evenings by singing and dancing around their campfires. On 21 June, they spotted



A monument to Mormon leader Brigham Young stands in the heart of Salt Lake City

GETTY IMAGES X5, ALAMY X2

Independence Rock – a 1,900-foot-long slab of granite that towers into the sky – and they clambered up the edifice to dance on top and paint their names on its weathered surface.

On 16 July, the Mormons rolled into Echo Canyon. As they struggled through the ravine, William Clayton, one member of the advance party, wrote "the mountains seemed to increase in height and come so together as too [sic] barely leave room for a crooked road". But they made it through, and a week later reached Salt Lake Valley. On 21 July, Orson Pratt and Erastus Snow made history as the first two Mormons to walk in the valley and see the great Salt Lake glimmering in the distance, with more arriving the next day.

Thomas Bullock was part of this larger party, and when he saw Salt Lake Valley he cried out, "Hurra, hurra, hurra, there's my home at last".

## MISSION ACCOMPLISHED

Young was at the rear of the group, suffering from a debilitating "mountain fever". But when he came into the valley on 24 July, the Mormon leader reportedly looked around him and declared: "This is the right place." More than a year after setting out from Nauvoo, the travellers had made it to their new home at last.

As Young trundled ahead, wagons carrying a further 1,500 people were rolling out of Winter Quarters following the same path. Although the area was made up of harsh, unrelenting desert, it didn't particularly matter. Outside the boundaries of the US, the Mormons were now finally free to live as they pleased, declaring their remote new home to be 'Zion'. Crucially, just as they had done in Nauvoo, the travellers also began to construct a new Mormon settlement: Salt Lake City. Young called it a "Kingdom of Heaven on Earth".

Over the course of the next 20 years, more than 60,000 Mormons found a home in this new "kingdom". Just like Young and the Camp of Israel before them, many people made the arduous journey by wagon, while some of the less fortunate travellers simply pushed small carts through the snow and mud. Scores of people lost their lives, but those who survived were welcomed to Salt Lake City with open arms.

By the time Young died in 1877, more than 100,000 people called the Great Basin home – many of whom were Mormons. The decision to head west all those years ago had paid off.

# FEBRUARY ANNIVERSARIES

## A LOOK BACK AT THREE OTHER EVENTS THAT HAVE TAKEN PLACE IN FEBRUARY THROUGHOUT HISTORY

### 26 February 1870

**FAN-TASTIC TRAVEL**

Inventor Alfred E Beach demonstrates his brand-new pneumatic subway to officials in New York City. Situated below Broadway, the subway enabled passengers to travel through an underground tunnel, powered by a huge fan. Unfortunately, Beach's hopes to expand the subway were dashed, and it closed three years later.

### 11 February 1990

**WALKING TO FREEDOM**

Nelson Mandela leaves Victor Verster prison in South Africa as a free man, having spent 27 long years behind bars for his role in fighting apartheid as a member of the African National Congress. In 1994, Mandela made further history when he was voted South Africa's president in the country's first democratic election.

### 26 February 1606

**DOWN UNDER**

The Dutch explorer Willem Janszoon lands on the west coast of Cape York Peninsula, Australia. He went on to map approximately 300km of coastline, making him the first European to chart part of the continent. However, Janszoon thought he'd reached New Guinea, not discovered a new landmass altogether.

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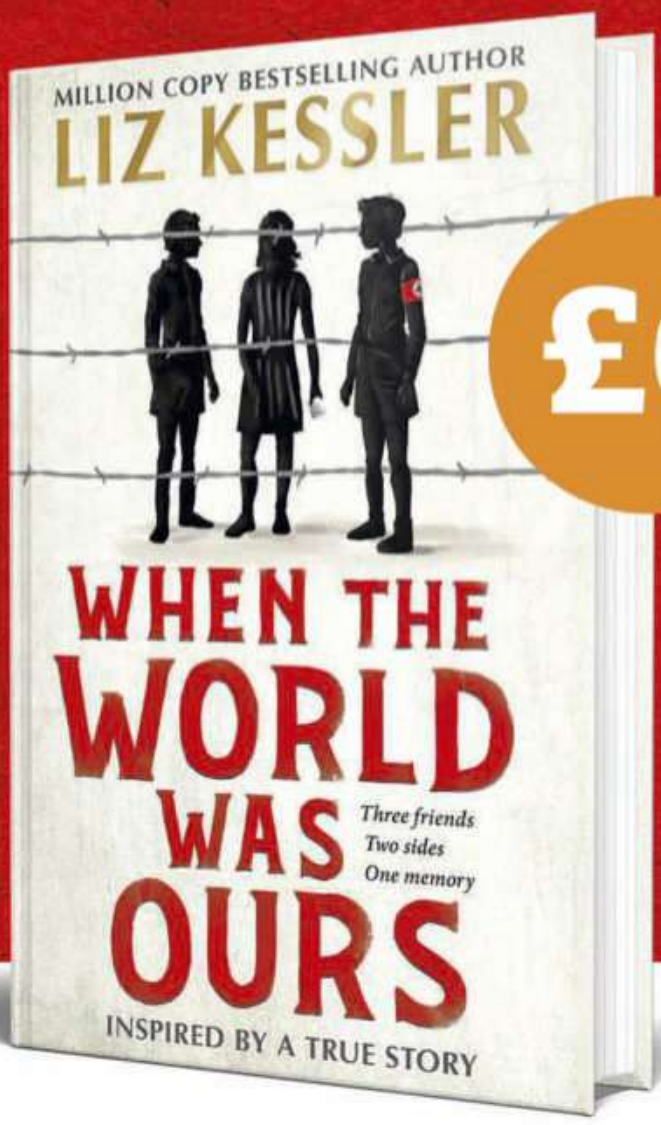


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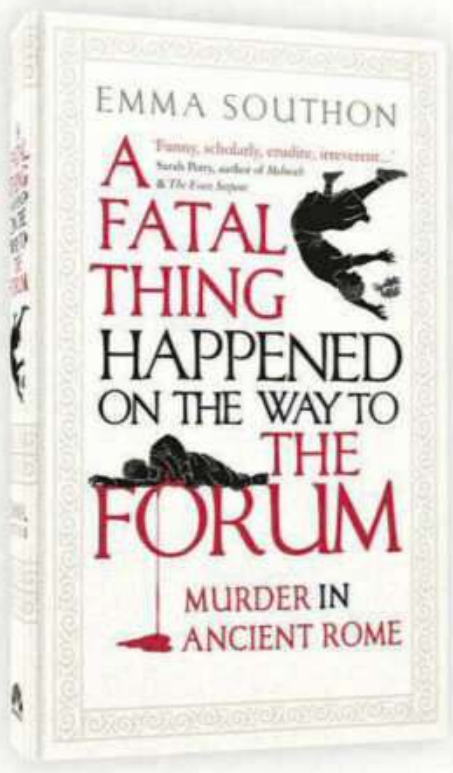


THEY CAME, THEY SAW, THEY MURDERED.

ONEWORLD

# The Irish Republican Army

Words: Jonny Wilkes

British troops guard a wall during the Irish War of Independence, which ironically bears a nationalist message

Éamon de Valera at a rally in 1920. He later founded Fianna Fáil and became Taoiseach

ALAMY X2

**WHAT IS THE IRA AND WHAT HAS IT FOUGHT FOR?**

The Irish Republican Army (IRA) is the name that has been used by a number of paramilitary groups in Ireland and Northern Ireland, all with the aim of ending British rule and establishing an independent republic within a unified Ireland. Willing to use violence even regarding it a necessary tactic the IRA has been classified as illegal and a terrorist organisation by the British and Irish authorities.

**WHEN WAS THE IRA FORMED?**

The movement for 'home rule', or self government of Ireland, gained momentum in the 19th century, and gave way to revolutionary efforts in the 20th century. Following the Easter Rising of 1916 a failed uprising in Dublin against British rule existing paramilitary groups such as the Irish Volunteers and Irish Citizen Army were succeeded by a new group, the IRA, in 1919.

**WHAT DOES SINN FÉIN HAVE TO DO WITH THE IRA?**

Today, Sinn Féin is one of the largest political parties in Northern Ireland. Formed in 1905, it first rose to prominence after the Easter Rising to become the political wing of the republican movement. While separate from the IRA, it shared the same goal, as well as many members.

In December 1918, Sinn Féin won a landslide electoral victory, claiming nearly three quarters of the 105 Irish seats in the British Parliament, leading to the establishment of an independent parliament, named Dáil Éireann. This emboldened the IRA, which, under the leadership of Michael Collins, fought the British Army in the guerrilla style Irish War of Independence (1919 21).

Sinn Féin split many times throughout the 20th century, including in 1970 when the dominant faction became closely associated with the IRA.

**WHEN WAS NORTHERN IRELAND CREATED?**

The Irish War of Independence ended in 1921 with a ceasefire and the partition of Ireland. A resulting treaty established the self governing Irish Free State containing 26 of Ireland's historic 32 counties, as well as the creation of Northern Ireland from the six remaining northern counties of Ulster, which were to remain part of the United Kingdom.

> "Despite being declared illegal in the 1930s and facing imprisonment without trial, the IRA continued to recruit"

Many members of the IRA (now known as the 'Old IRA') opposed the treaty. Led by Éamon de Valera, they split from Sinn Féin and, from 1922 23, fought a civil war against the provisional government. The pro treaty forces won thanks to British support, but de Valera turned to the political arena and created a new party, Fianna Fáil, in 1926. He would later become Taoiseach, or prime minister, in 1932.

**WHAT DID THE IRA DO NEXT?**

Despite being declared illegal in the 1930s and its members facing imprisonment without trial, the IRA continued to recruit. During World War II, some members even attempted to collude with Adolf Hitler to help drive out the British. The leaders were caught and executed.

In 1949, Ireland – so-called since 1937 – officially withdrew from

# IN A NUTSHELL

## YOUR BRIEF EXPLAINER TO HISTORY'S HOT TOPICS

the Commonwealth and became a republic, so the IRA focused all efforts on Northern Ireland. It launched its border campaign in 1956, but failed to secure mass support. Many in Northern Ireland were unionists or loyalists (they wished Northern Ireland to stay within the UK), and the division had seismic religious implications as Northern Irish unionists were mainly Protestant while republicans were overwhelmingly Catholic.

### WHAT WERE 'THE TROUBLES' AND HOW WAS THE IRA INVOLVED?

Beginning in the late 1960s and lasting until 1998, the Troubles was one of the bloodiest chapters in Northern Irish history, in which around 3,600 people died and tens of thousands were injured.

Civil rights campaigns protesting against Catholic discrimination especially concerning housing, jobs and voting rights had emerged in the 1960s, but, despite being non violent, came into regular conflict with loyalists and the Protestant dominated police, the Royal Ulster Constabulary.

Clashes escalated until 12 August 1969, when three days of fighting broke out in the city of Derry/Londonderry over a parade of Apprentice Boys (a Protestant society) marching past the Catholic Bogside area. The so called battle of the Bogside ended with British troops being sent in and building 'peace walls' to separate Catholics and Protestants. This was the beginning of an almost 38 year deployment called Operation Banner.

A weakened IRA rallied in the chaos, but soon divided over the use of violence. In 1969, it split into two factions: the Official IRA committed to peaceful means while the Provisional IRA (the 'Provos') believed militancy was the only way forward. The Provos became dominant in the Troubles and started its guerrilla campaign the Long War in 1970. Through bombings, assassinations and ambushes, the Provos hoped to make Northern Ireland ungovernable. The British and unionists retaliated by arresting suspected IRA members or supporters in droves, interring them without trial, and perpetrating their own attacks.

### WHAT HAPPENED ON BLOODY SUNDAY?

On 30 January 1972, British soldiers opened fire on unarmed civil rights demonstrators in Derry/Londonderry protesting against internment without trial 13 people died (another would die from his injuries several months later). The ensuing investigations exonerated the soldiers and it wasn't until 2010 that an inquiry concluded the killings on Bloody Sunday as "unjustified and unjustifiable", as stated by then British prime minister David Cameron to parliament. In the immediate aftermath of the events of 1972, anger among nationalists led to a surge in IRA recruitment.

### WHAT WERE THE WORST ATTACKS COMMITTED BY THE IRA?

Later in 1972, the Provos set off more than 20 bombs in Belfast, timed for just an 80 minute window on 21 July. Bloody Friday left nine dead and around 130 injured, many of them civilians. In retaliation, the British launched Operation Motorman to retake the 'no go zones' areas of the city usually controlled by republicans. That year also saw the dissolving of the Northern Irish parliament and the British taking direct rule once more.

In 1973, the IRA campaign escalated with the targeting of the British mainland. Bombs went off on a bus carrying soldiers in Yorkshire; at the Tower of London and Houses of Parliament; and in cities such as Bristol. The most devastating were the bombings of two pubs in Guildford on 5 October, and two pubs in Birmingham on 21 November, killing five and 21 people respectively. At a time of particularly high tension, British police were under pressure to act and made quick arrests only for it to be later proven that the so called Guildford Four and Birmingham Six were wrongfully convicted.

The IRA claimed its highest-profile

BOTTOM: **Members of the 'Birmingham Six' walk free in 1991 after their earlier convictions were overturned**

BELOW: **The aftermath of an IRA bombing at the Mulberry Bush pub in central Birmingham, November 1974**

The clashes of Bloody Sunday saw more than a dozen civilians killed by the British Army

GETTY IMAGES X3, ALAMY X3

Garret FitzGerald and Margaret Thatcher sign the Anglo-Irish Agreement in November 1985

Sinn Féin's Martin McGuinness (centre) and Gerry Adams (right) did not take their seats when elected MPs in 1997

"Prisoners took part in 'dirty protests', where they refused to wash and smeared their cells with excrement"

casualty on 27 August 1979 when it planted a bomb on the boat of Lord Mountbatten, cousin of Queen Elizabeth II. He died along with three others. Just a matter of hours later, an IRA unit ambushed British soldiers close to the border, killing 18.

### HOW WAS THE IRA FUNDED AND ARMED?

As an illegal organisation, the IRA had moneymaking opportunities through criminal means, such as armed robberies, extortion and smuggling. Members who owned businesses also helped raise money, but a chief source of funding during the Troubles came from wealthy Irish American sympathisers through an organisation known as NORAID, or the Irish Northern Aid Committee. Weapons were imported from other countries, including the US, regions of Eastern Europe and Libya.

### WHO WAS BOBBY SANDS?

Imprisoned at the notorious Maze Prison, IRA member Bobby Sands began a hunger strike on 1 March 1981 to protest the removal of 'special category' status meaning he and his comrades were treated as criminals rather than political prisoners. Other acts of resistance had included wearing blankets instead of uniforms and taking part in 'dirty protests', where they refused to wash and smeared their cells with excrement.

Sands's hunger strike lasted 66 days before he died, but not before he had made global headlines and was elected to Westminster. Hailed as a martyr, some 100,000 attended his funeral procession and nine other inmates would die from their own hunger strikes.

### WHAT WAS THE GOOD FRIDAY AGREEMENT AND HOW DID IT COME ABOUT?

Attacks continued throughout the 1980s, including an IRA bombing of a Remembrance Day service in Enniskillen, which killed 11 civilians, and an ambush of the SAS in Loughall both in 1987. But political manoeuvrings started bearing fruit too.

In 1985, British Prime Minister Margaret Thatcher and Irish Taoiseach Garret FitzGerald signed the Anglo Irish Agreement, giving the Irish government a role in Northern Ireland affairs on the condition that they recognised that unification could not happen unless it was supported by a majority of citizens. This was met with mixed reactions, being opposed by unionists and the IRA alike, but was a first step in seeking peace.

Sinn Féin grew in influence under the leadership of Gerry Adams and Martin McGuinness, who instigated talks with the leader of the Social Democratic and Labour Party, John Hume. By August 1994, enough progress had been made that the IRA declared a "complete cessation of all military activities", although this was temporarily broken with a bombing in London amidst frustrations that Sinn Féin was being excluded from talks. It was only by agreeing to IRA decommissioning and committing to non violence that Sinn Féin was allowed to participate in September 1997.

On 10 April 1998, the Good Friday Agreement was signed. Widely seen as the end of the Troubles, it established new institutions: a devolved government and the Northern Ireland Assembly, where power had to be shared by parties on both sides. The Royal Ulster Constabulary was also replaced by the new Police Service of Northern Ireland.

### DID THE IRA DISBAND AFTER THE AGREEMENT?

Deep seated distrust meant that many in the IRA, led by Michael McKevitt, opposed the decommissioning. He formed his own political party and an armed unit dubbed the Real IRA, which was responsible for several bombings. The worst came on 15 August 1998 when a car bomb exploded in Omagh, killing 29 people and injuring hundreds.

While the British deployment in Northern Ireland ended in 2007, dissident republican groups who oppose the peace agreements are still active, including the Real IRA, the Continuity IRA and the so called New IRA. Every group claims to be the only rightful successor to the Original IRA of 1919.

A nationalist mural on Belfast's Falls Road honours the hunger striker Bobby Sands, who died in 1981

**WATCH**

An eight-part series, *Spotlight on the Troubles: A Secret History*, is available via BBC iPlayer *bbc.co.uk/iplayer/episodes/m0008yrj*

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YOUR ESSENTIAL GUIDE TO THE

# HISTORY OF MEDICINE

The world's ongoing battle against Covid-19 has been a sobering reminder of our vulnerabilities as human beings. In spite of all our 21st-century luxuries, the fact that a microscopic virus can rampage across the globe and inflict the damage it has done remains difficult to comprehend.

Yet, with groundbreaking new vaccines being rolled out to tackle the current pandemic, it's hard not to marvel at the wonders of modern medicine, and just how much scientific progress has been made in order to have reached this point.

Over the following pages, we'll be charting the evolution of medicine over the past 2,500 years, revealing the ways in which our ancestors sought solutions to some of the worst maladies the world has ever seen: from typhoid and tuberculosis to syphilis, smallpox and the Black Death.

Along the way we'll meet a diverse cast of doctors and scientists whose discoveries transformed our understanding of the human body, while also answering key questions about public health through the ages. When were vaccines invented? Who was the first person to prove that germs were capable of causing disease? What on earth was a 'gong farmer'?

We begin over the page with a Q&A with historian Professor Mary Fissell, who also offers her expert insight throughout this essential guide...


**28 Everything you wanted to know about the history of medicine**
Professor Mary Fissell answers key questions about healthcare in the past, and discusses the changing role of women – both as patients and physicians

**32 Ancient healthcare**
How the work of early scholars such as Hippocrates and Galen would come to dominate medical thinking for hundreds of years

**36 Medicine in medieval times**
Although medical treatment was still far from sophisticated, the Middle Ages saw the emergence of the first 'qualified' physicians

**40 Six surprising facts about the history of medicine**
Did you know that cataract surgery was performed in 6th-century India? This, and five other unexpected tidbits from medicine's past revealed

**44 A medical renaissance?**
Explore the early modern period, when physicians began to question established doctrine and introduce new measures to combat plague

**48 Healthcare in 18th-century Britain**
Inside the great medical innovations of the 1700s, when doctors started to take a preventative rather than reactive approach to healthcare

**50 Victorian medicine**
How the 19th century paved the way for many of the medical marvels that continue to benefit us today – from anaesthesia to X-rays

**54 20th-century breakthroughs**
We explore 10 giant leaps in medicine during the previous century, and reveal how the National Health Service transformed postwar Britain

**MARY FISSELL** is professor of the history of medicine at the Johns Hopkins University, Baltimore. Her work mainly focuses on how ordinary people in early modern England understood health, healing and the natural world.

# EVERYTHING YOU WANTED TO KNOW ABOUT THE HISTORY OF MEDICINE

**Professor Mary Fissell** answers key questions on healthcare of the past

INTERVIEW: RACHEL DINNING

PODCAST

Professor Mary Fissell discusses the history of medicine on the HistoryExtra podcast. Listen at *historyextra.com/podcast*

**Q: What would you say are the three biggest turning points in the history of medicine?**

**A:** Every historian will have different thoughts on this, but I would say inoculation for smallpox, which made its way to Europe and the US in the 18th century. The West was pretty late to the party, though, as inoculation had already been taking place in Asia and Africa for a long time. Smallpox ravaged through populations, so the idea that human intervention could actually change lives was a really important milestone.

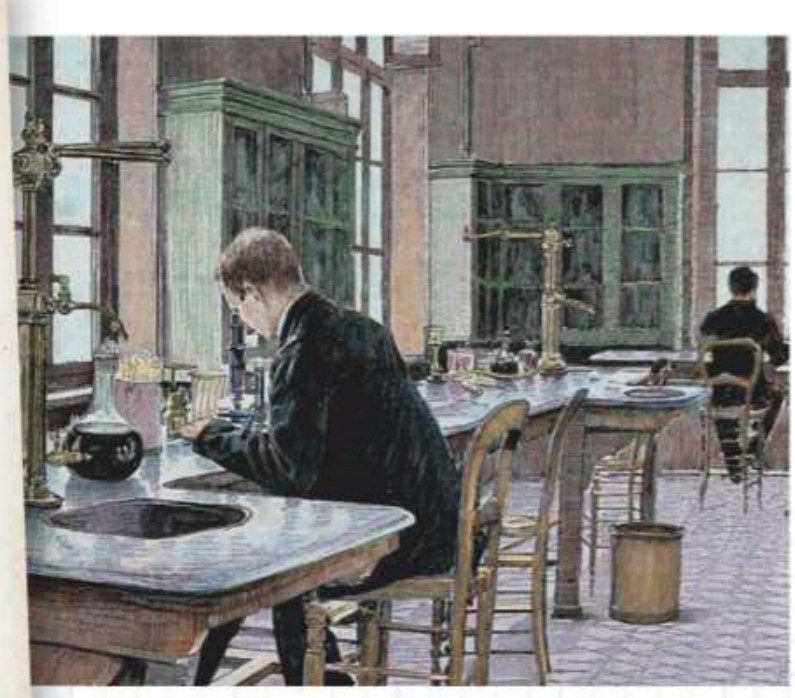
The next game-changer was germ theory in the 19th century – the discovery that germs cause disease. And the third turning point I would choose was the advent of contraception. The ability to make pregnancy a choice rather than a happenstance was really significant, and that started to become a more widely publicised thing in the early 19th century.

**Q: Do you think it's fair to say that the history of medicine has been one of steady progress and continual improvement?**

**A:** I don't think it's necessarily been a steady upward trajectory to get to where we are now. Of course, I'm certainly grateful that I live today – in a world of anaesthesia, antibiotics and antisepsis – but there are things we've lost as well as gained on the way here. Certain kinds of patient autonomy in terms of the ways in which patient narratives of illness were attended to in the past, for example. Today, they're often reduced to laboratory numbers and tests. Medical progress is a more complex picture than just onwards and upwards. Overall, of course, the advent of scientific medicine has been a tremendous benefit to humankind and has really changed the face of how we live.

**Q: What advancements in medicine have occurred off the back of practices or experiments that we might consider unethical today?**

**A:** Well, I'd go back to one of my earlier examples of inoculation, which was brought to England from Constantinople by Lady Mary Wortley Montagu. Condemned prisoners were offered the option of being 'guinea pigs' for inoculation – if they survived, they would be freed. That's not what we would call informed consent! I think six people were inoculated in total: three men and three women. And then one of the women had to nurse smallpox patients back to health to show that, in fact, she was immune.



ABOVE: **French chemist and microbiologist Louis Pasteur made huge breakthroughs in vaccines, germ theory and, of course, pasteurisation**

LEFT: **A medical illustration showing different forms of bacteria from the 19th century, when bacteriology was first being understood**

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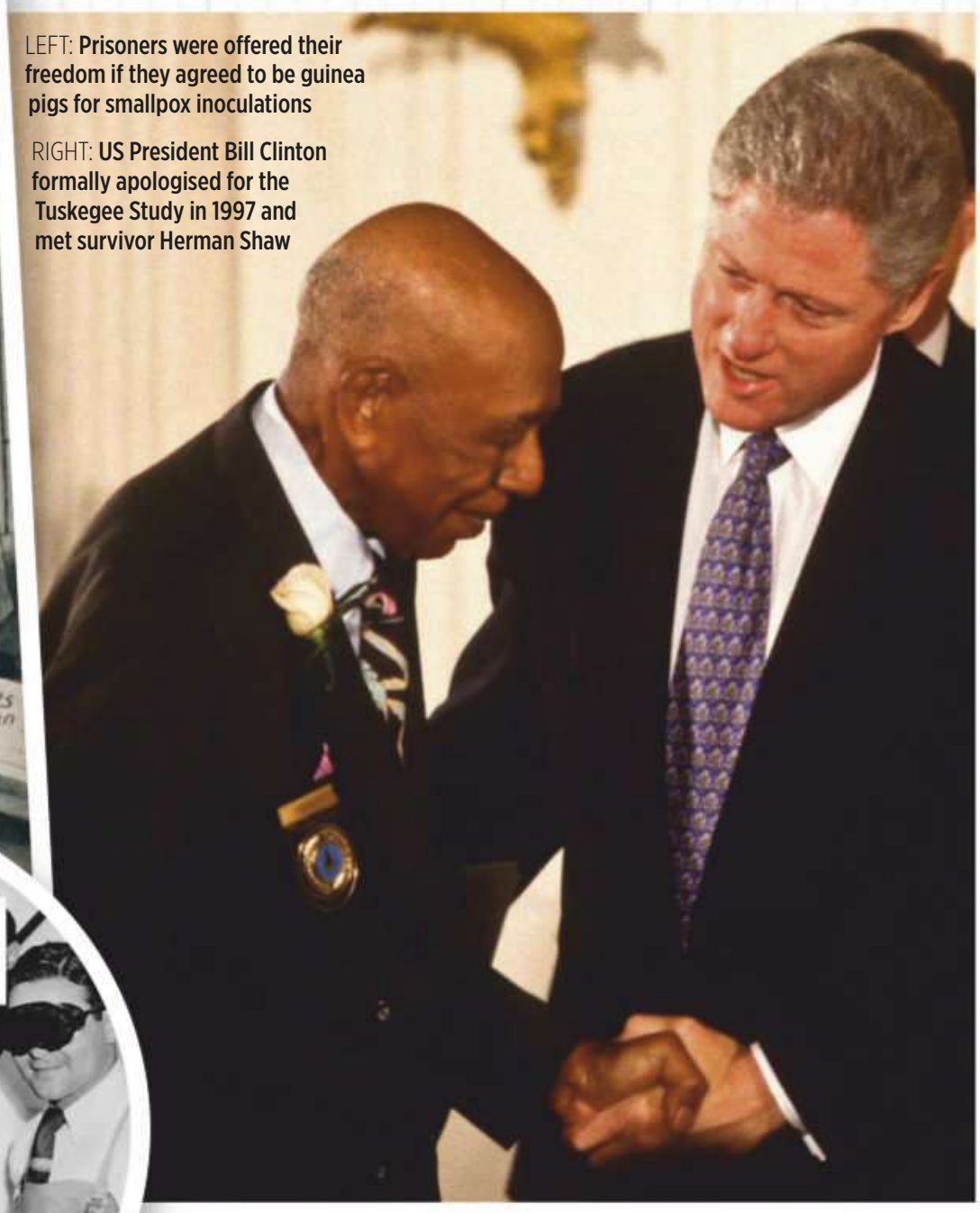
Prisoner being inoculated with the smallpox virus
Girl prisoner inhaling the virus
Smallpox virus and implements of the physician

The infamously unethical Tuskegee Study ran for 40 years; here, one of the men involved is given an X-ray



LEFT: **Prisoners were offered their freedom if they agreed to be guinea pigs for smallpox inoculations**

RIGHT: **US President Bill Clinton formally apologised for the Tuskegee Study in 1997 and met survivor Herman Shaw**

It was ethically wrong in every way, yet it did show that inoculation was safe and successful, and helped establish an inoculation movement, so it was a real advance.

**Q: When did medical ethics on the idea of informed consent – when a healthcare provider educates patients about the risks or benefits of a procedure – come into practice?**

**A:** Informed consent was really the product of the Nuremberg trials after World War II and the revelations of the horrific experimentations that had taken place in the concentration camps. Everyone recognised that a firm line had to be drawn, so that was really the first kind of codification of informed consent. There had been forms of medical ethics before the 20th century, but they hadn't really been focused as much on the patient. Often they were focused, in part, on a doctor's relationships with other doctors – how to behave professionally and act politely with your colleagues – as much as about a bedside manner.

The clinical study 'Tuskegee Study of Untreated Syphilis in the Negro Male' that ran from 1932 into the 1970s was a watershed moment in terms of the sort of harm that not attending to medical ethics could cause. The study in Tuskegee, United States, initially involved 600 black men 399 with syphilis and 201 who were not infected and was conducted without the patients' informed consent.

The men, mostly poor sharecroppers from Alabama, were told they were being treated for 'bad blood' (a local term for ailments as varied as syphilis, anaemia, and fatigue) and received free medical exams, a free meal on the day of the exam, and burial insurance in exchange for being part of the study. In reality, none of the patients received any treatment at all, even those with syphilis. All that happened was that they were monitored until they died and then the family was asked to grant permission for an autopsy so that they could look at the pathological study of the damage syphilis had done to these men. The Tuskegee Study was initially meant to last six months, but ended up running for 40 years.

When it was finally outed publicly by a journalist in 1972, everyone was appalled. But the results of the study were published in medical journals for decades between the 1930s and the 1970s, and somehow nobody seemed to think about how incredibly unethical the study was.

**"None of the patients received any treatment... they were monitored until they died"**

**Q: Were there any repercussions in that case for the medical people involved?**

**A:** The surviving patients – and there weren't many of them – and families eventually received an apology from the White House and sums of money that were supposed to be some kind of recompense. But I don't think we can possibly think that justice was truly done for those men and their communities.

The other thing I would want to add about the Tuskegee Study is that it contributed hugely to the kinds of distrust that many black Americans have of the medical profession. It caused ▶

real, long-lasting harm in terms of healthcare, access, trust, and the patient-practitioner relationship. The knock-on effects have been substantial. Many African-Americans know the story of the Tuskegee Study, as well they should.

## Q: Have male and female bodies been considered medically different throughout history?

**A:** Yes, but in different ways. According to the theory of the four humours, women were thought to be colder and wetter than men, who were seen as hot and dry. That makes sense because everyone knows if you want to grow a new seed, a cool, damp field is a lot better than a hot and baked one, and since it was women whose bodies carried new life, it made sense to think that they were cold and wet.

So there was a whole set of explanations about how women were different. As humoral theory waned, we moved into a period where men and women were seen as being wholly different. Women's nerves were believed to be finer and more delicate, while men were more robust; men were ruled by their heads while women were ruled by their uteruses; women were irrational creatures, and so on.

From a gender-relation perspective, it was definitely a step backwards from humoral medicine. It really made women different in every cell of their body, and not in a good way. It's only in the much more recent past that we've come to understand gender and sexual differences in a more nuanced way.

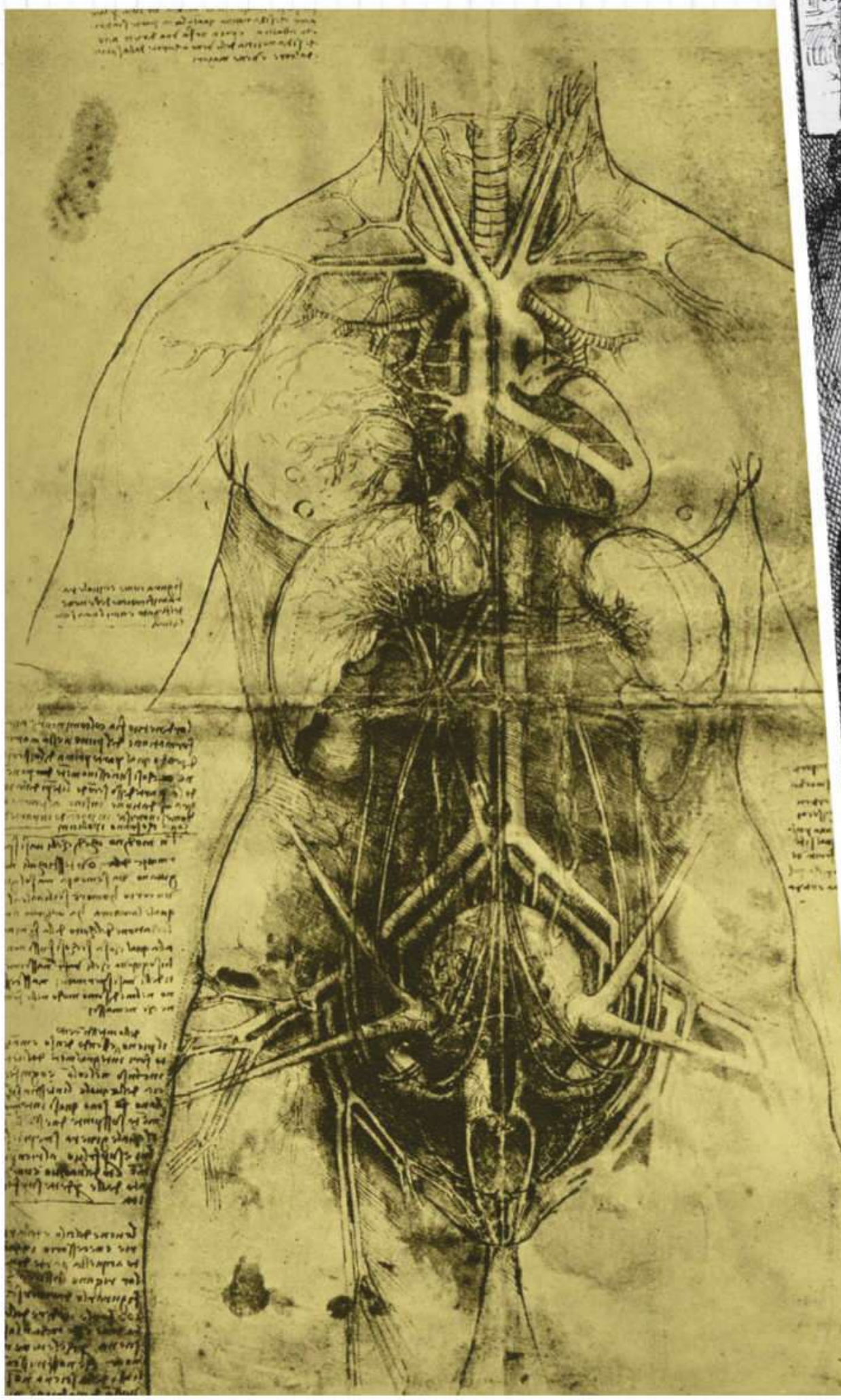
For much of the 20th century, in medical terms, man was seen as the default in every way and women were thought about only in terms of their differences to men. So in other words, you studied female anatomy if you had to learn about pregnancy and reproduction, but the male was the type and woman was the alternative. I don't think that really helped women's health very much.

## Q: What are some significant contributions made by women to the practice of medicine?

**A:** Women have been healing in various ways since forever! It was only with the growth of universities in the 13th and 14th centuries that some people started to be labelled 'doctor'. And those people were men because you had to be male and know Latin in order to attend a university. But that doesn't mean there weren't women healers.

There's evidence from a trial in 1322 that's particularly striking. A woman named Jacqueline Felice de Almania was brought before the Paris Faculty of Medicine, which didn't like the fact that she was practising medicine. Felice gave a really interesting testimony in her defence, saying that she'd healed patients successfully, including patients that some of the male faculty had not succeeded in healing. Clearly, she was an experienced practitioner. Nevertheless, she lost her case under threat of excommunication.

Now, Felice was just one example, but there were probably many others like her.



A dissection of a woman by Leonardo da Vinci; under the four humours theory, women were seen as colder and wetter than men

**"With the advent of universities, women had to practise medicine in the shadows"**

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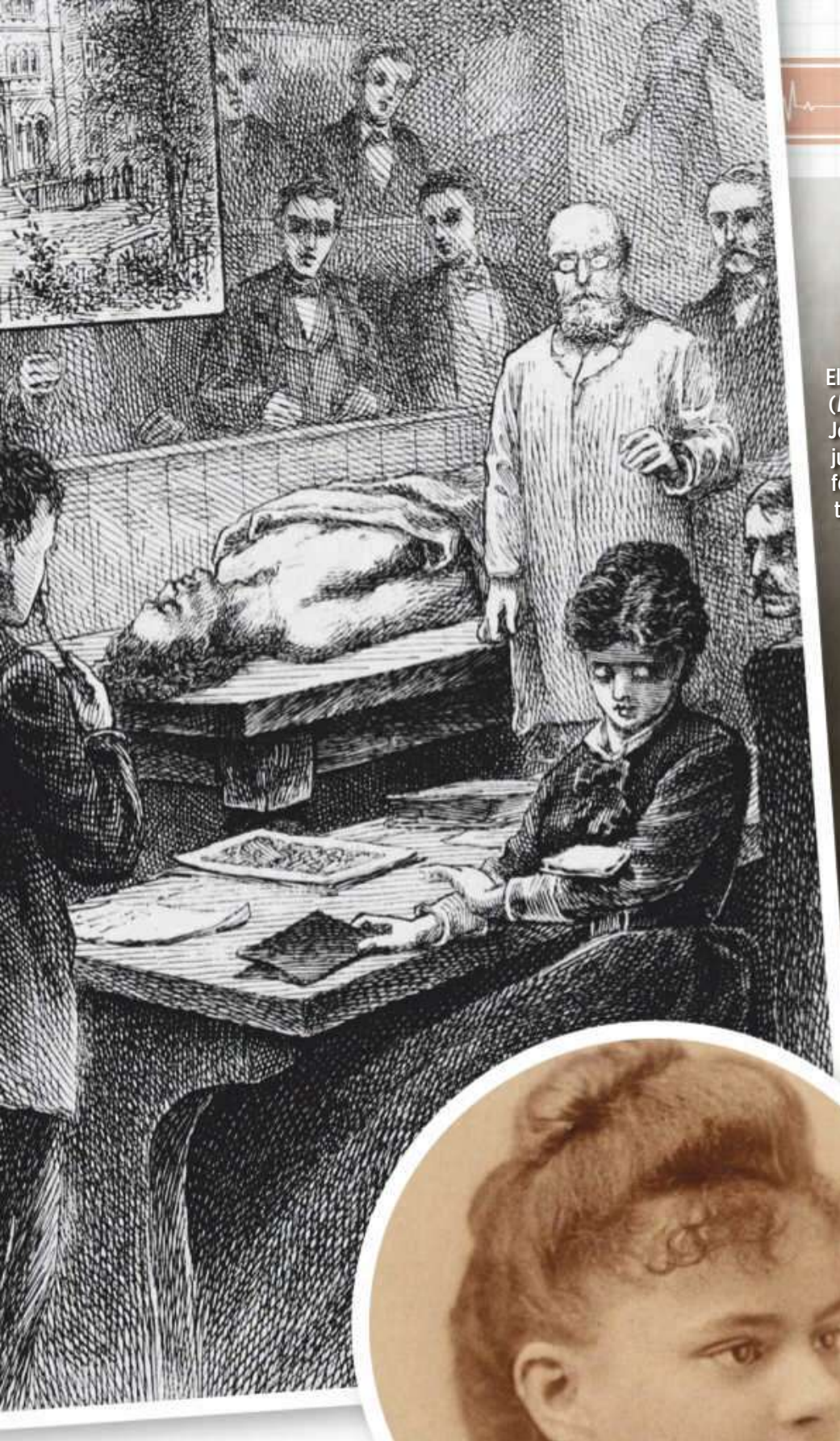

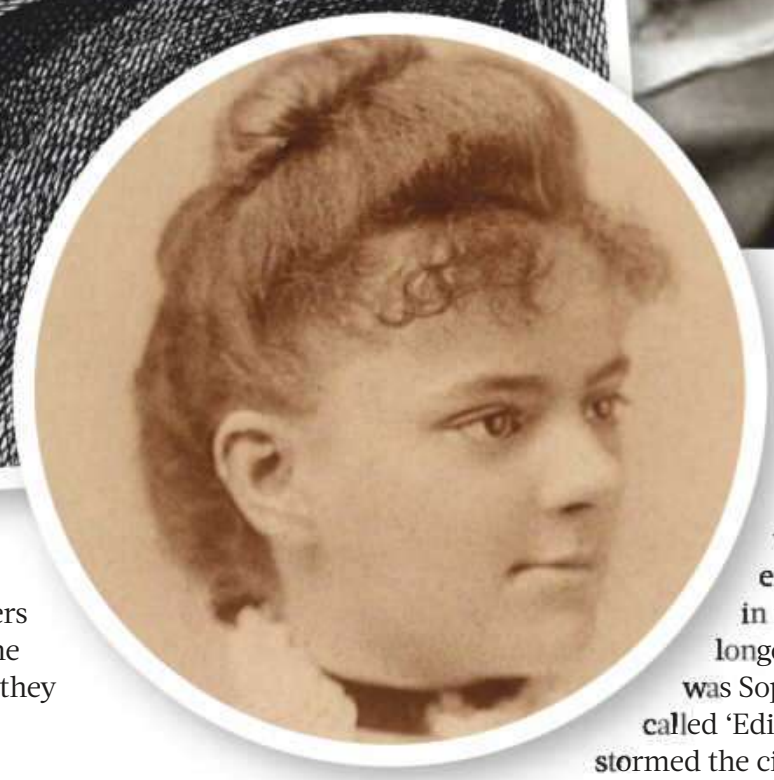

Elizabeth Blackwell was the first woman with a medical degree in the US and first woman on the British medical register

Elizabeth Blackwell (*left*) and Sophia Jex-Blake (*right*) were just two women who fought to be admitted to medical school

If not for Helen Brooke Taussig, blue baby syndrome would have claimed many more lives

We know there were plenty of women healers in the past, but with the advent of universities, they had to practise in the shadows more.

Technically, the first woman doctor was Elizabeth Blackwell, who was born in Bristol, UK, in 1821. Her family emigrated to the United States because her father was involved in abolition work and Elizabeth decided she wanted to be a doctor after she saw a female friend die a very painful death.

No medical schools would take her and when she applied to Geneva Medical College in upstate New York they didn't really know what to do with the request. So the faculty decided to let the students vote as to whether or not Elizabeth should be admitted. To the faculty's horror, the (male) students thought the idea of letting a woman study medicine was hilarious and said yes. Blackwell was admitted in 1847 and graduated in 1849, before returning to England for a while. She became the first woman on the British medical register.

It was really the foundation of women's medical colleges in the US during the 1850s when we begin to see women entering medical education in real numbers. It took longer in Britain, though. It was Sophia Jex-Blake and the so-called 'Edinburgh Seven' who finally stormed the citadel, as it were, and were actually allowed to go to medical school in Edinburgh in 1869. Shamefully, that did not allow them to graduate or qualify as doctors.

Once again, it was the establishment of medical colleges for women in Britain that created the space for women physicians. In both the US and Britain, these pioneering women started opening small hospitals where women could get clinical training. And that's really how women were able to become physicians.

**Q: For you, what is a really stand-out contribution to the history of medicine made by a woman?**

**A:** Oh, I think it has to be paediatric cardiologist Helen Taussig's work performed here where I am, at Johns Hopkins University – in the mid-20th century. She devised a means to improve blood oxygenation in babies born with Tetralogy of Fallot (also known as 'blue baby syndrome', where heart defects keep the blood so starved of oxygen that the baby appears blue). Taussig's procedure, developed with fellow surgeon Alfred Blalock and surgical technician Vivien Thomas, saved the lives of thousands of newborn babies and has come to be seen as the foundation of paediatric cardiology.

# MEDICINE IN ANCIENT TIMES

People may have believed the body was made up of the four humours and prescribed mercury at will, but that didn't mean there were no ancient medical advances

**WORDS: EMMA SLATTERY WILLIAMS**

Many diseases, infections and injuries that are easily treated today could have been tantamount to a death sentence in ancient times. In the days before life changing advances like antibiotics and X rays, vaccines and anaesthetics, one could be forgiven in thinking that ancient peoples did not make their own steps forward in medicine; yet great minds in ancient civilisations still strived to learn all they could about the human body including how to look after and cure it.

One of the most important theories in ancient medicine was that the body was made up of four 'humours' fluids that determined a person's health and behaviour. Humourism was "the bedrock of Western medicine for literally two millennia," according to Professor Mary Fissell from the Department of the History of Medicine at the Johns Hopkins University. The four humours – blood, yellow bile (also called choler), black bile (melancholy) and phlegm were thought to correlate with the four elements of earth, air, fire and water; if they became unbalanced within the body, illness and disease was thought to occur. If a person was vomiting, for example, medical advice would have been to continue purging the unwanted fluids that were upsetting the humours.

The names most associated with the development and spread of the four humours theory are Hippocrates, the so-called 'father of Western medicine' in the fifth century BC, and Galen, the renowned physician of the second century AD, whose work treating the wounds of gladiators allowed him the opportunity to study the human body. Belief in the four humours would dominate Western

The works of Galen, a physician of the Roman Empire, helped define medicine for centuries

From ancient times to the Renaissance, the theory of the four humours would be a medical mainstay

This 3,000-year-old prosthetic big toe, attached to the foot of an Ancient Egyptian mummy was made of wood and leather

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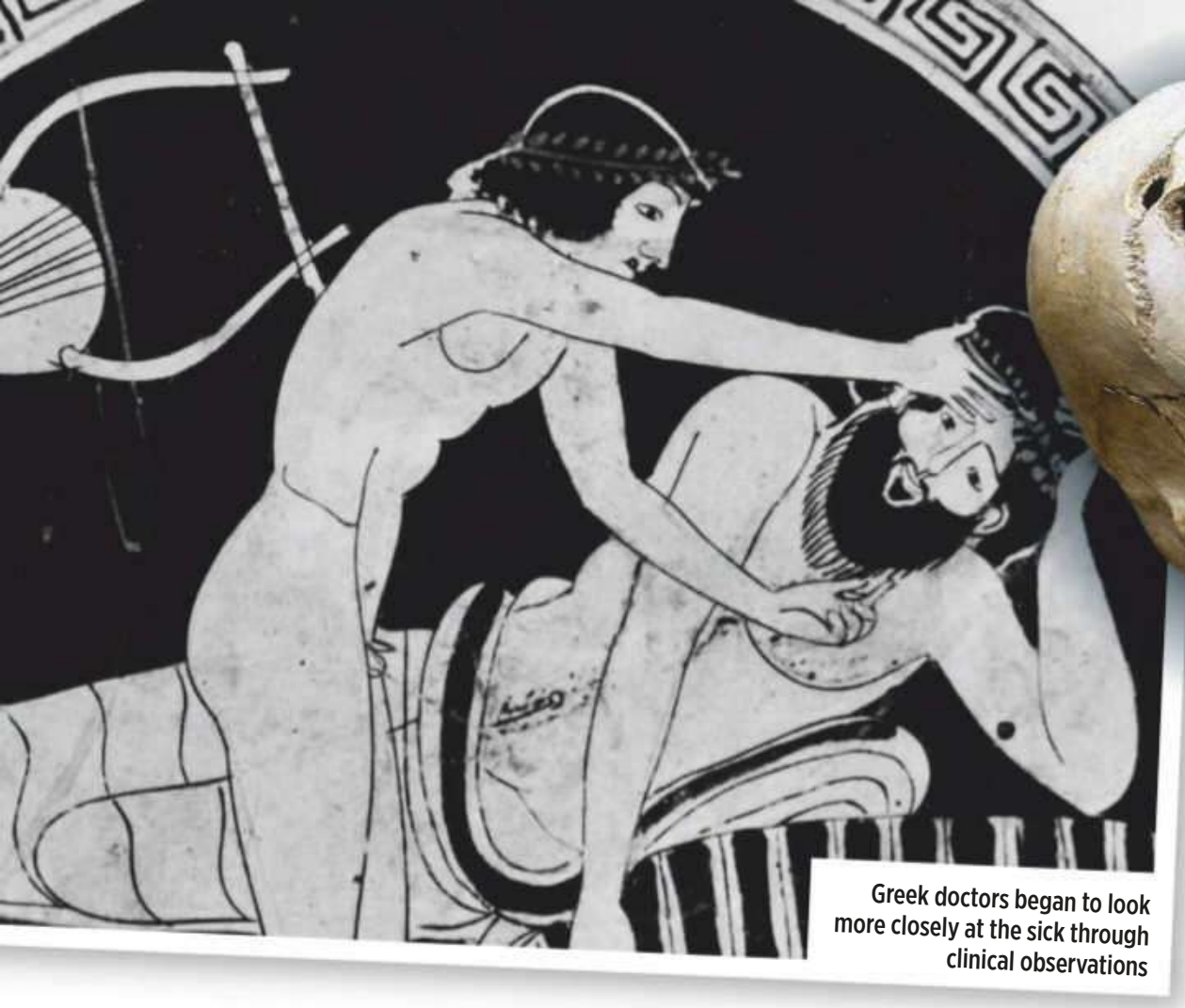
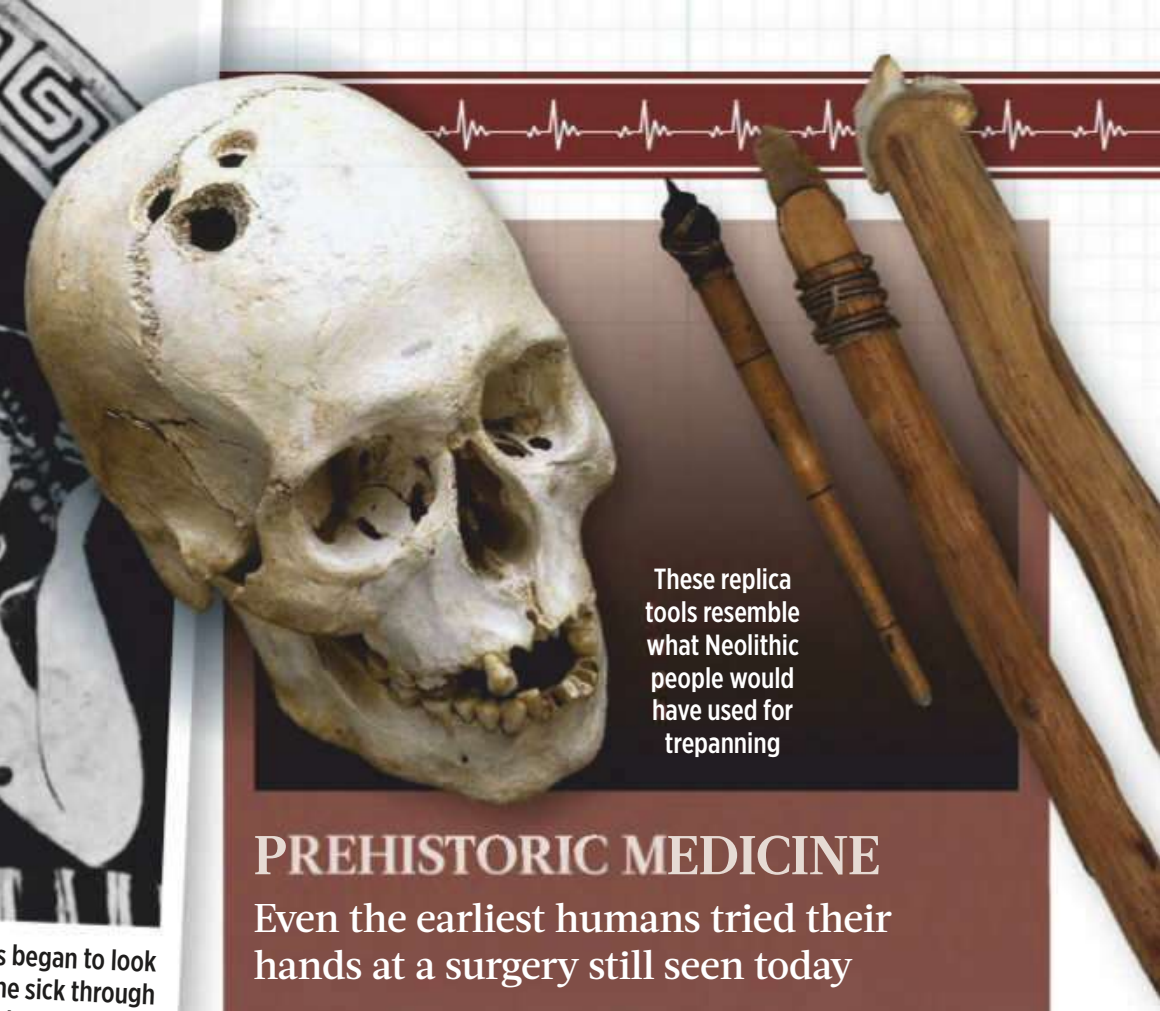


Greek doctors began to look more closely at the sick through clinical observations



These replica tools resemble what Neolithic people would have used for trepanning

## PREHISTORIC MEDICINE

### Even the earliest humans tried their hands at a surgery still seen today

If you thought that prehistoric peoples needed an understanding of surgery like they needed a hole in the head, you'd be right.

There is archaeological evidence from the Neolithic period of perhaps the world's oldest surgical procedure: trepanning. This involved drilling or cutting into the skull and removing a section of bone, usually circular in shape, which would have released pressure on the brain. Examinations of trepanned skulls have shown bone growth at the site of the hole, indicating that the patient lived for some years after the procedure.

It is possible that early trepanning was done to release evil spirits, but Fissell stresses that there may have been more to the procedure than this: "We should never underestimate millennia of trial and error and the kinds of observational powers of people in the past. If something worked, then you did it again."

Prehistoric skeletons have also been found with healed fractures, suggesting that some knew how to mend bones. Fissell concludes: "Prehistoric man was doing what we think of as surgery and sometimes successfully, which is pretty remarkable."

**"We can't underestimate millennia of trial and error"**

medical thought for centuries to come.

Ancient civilisations had their own unique ways of treating illness, including Ancient Egypt. "One of the earliest manuscripts we have on papyrus is about surgery," says Fissell. "The Egyptians were performing various kinds of surgery, including wound care and fractures; if there was a swelling on the surface of the body they would often try and remove it."

The papyrii that have been found describe anatomical observations, the diagnosis and treatment of diseases, and spells and incantations intended to ward off evil spirits thought to cause illnesses. Archaeologists have also discovered artificial toes from Ancient Egypt – the earliest-known prosthetics.

### POWERS OF OBSERVATION

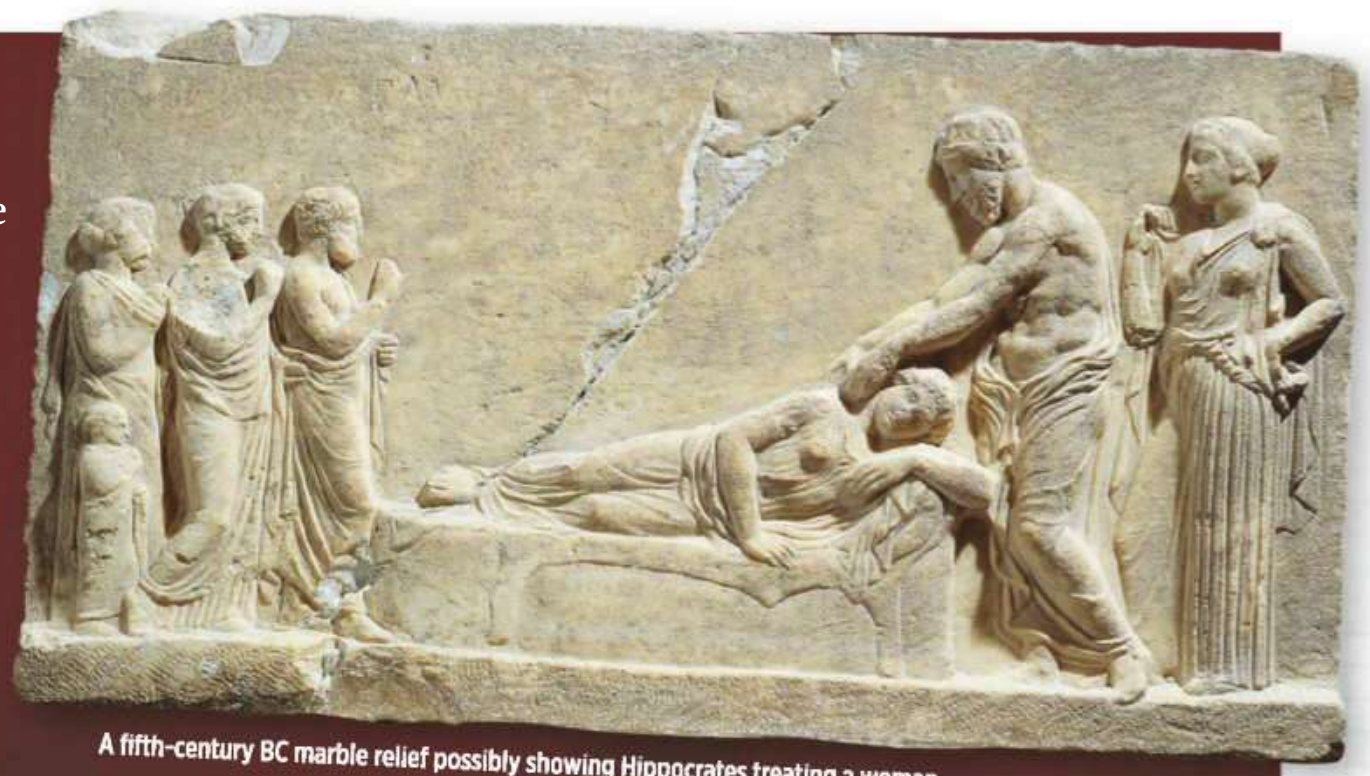
Medicine had epochal breakthroughs in Ancient Greece, thanks in no small part to Hippocratic medicine. Not only did these doctors advocate a higher degree of professionalism and teaching, but they gave due importance to the power of observation: the physical examination of the body for the source of an ailment or watching an unwell patient to see how their symptoms progressed,

## HIP HIP HOORAY FOR HIPPOCRATES

### The medical marvel of Ancient Greece

The fifth-century BC physician and philosopher Hippocrates is often named as the 'father of Western medicine'. He looked for rational reasons for illness and disease rather than relying on supernatural and spiritual causes.

The many works bearing his name – although it is unlikely he wrote all of them – influenced Western medicine for centuries, not least in the Hippocratic Oath, a declaration of ethics. To this day, doctors in many countries recite an updated version of the oath in recognition of their responsibility in upholding high ethical standards.



A fifth-century BC marble relief possibly showing Hippocrates treating a woman

## FIVE CURIOUS CURES FROM ANCIENT TIMES

### ▶ BLOODLETTING

This remained a common treatment for many ailments right up until the 19th century. Ancient physicians used bloodletting to help the body get rid of whichever humour was deemed to be out of balance. Either a vein would be cut, or leeches used to suck out the unwanted blood. Unsurprisingly, the side effects of bloodletting could include fainting or even death from blood loss.

### ◀ ANIMAL DUNG

With what we know about germs and bacteria today, animal excrement might not be the first item we'd reach for when ill, but the Ancient Egyptians swore by it. The Ebers papyrus, which dates to around 1550 BC, advocated its use for everything from a healing cure to a contraceptive. In ancient Iranian medicine, the dung of a female donkey, known as Anbarnasara, was pushed up the nostrils as a cure for nosebleeds.

### ▶ THE WANDERING WOMB

The womb was believed to exert extraordinary influence over female physiology; it could cause suffocation and even death if it got out of hand. One cure for a womb in trouble was fragrant smells around the groin, but another was marriage; sexual activity was thought to be very important for a woman's health, but it had to be legitimate.

### ◀ WILLOW

Both the Ancient Egyptians and Hippocratic medicine recommended the bark of the willow tree as a type of pain relief and antipyretic (a drug used to reduce or prevent fever) – centuries later, in 1763, a study by the Royal Society proved willow bark's effectiveness. The active agent in willow bark is salicin, which, in the 19th century, would form the basis of the discovery of aspirin (*see page 50*).

### ▶ BABYLONIAN SKULL CURE

Demons and punishments by the gods were thought to be the cause of illness for ancient Babylonians, so a supernatural remedy was needed. To aid with teeth grinding, the patient was told to sleep next to a human skull for a week as it was thought that the spirit of a dead relative might be trying to get in contact. Kissing and licking the skull was required to ensure that the spirit was exorcised.

GETTY IMAGES X6, ALAMY X2

Hygiene-aware Romans built sewage systems and toilets, like these in Ostia

**"Hippocrates ensured his patients were observed at least once a day"**

◀ and then acting on what you saw. Hippocratic doctors emphasised bedside medicine. They visited patients often and carefully noted how the patient had slept, excretions, mood, and whether they were feverish. Hippocratic teachings aimed to add rationality to medicine and separate the discipline from religion.

The Hippocratic tradition also took environmental factors into consideration, such as how changes in the weather could affect the body. Yet even Hippocrates didn't completely dismiss the idea of supernatural intervention. "He didn't tell people not to perform religious healing", says Fissell. "He just argued that naturalistic explanations should be used in relation to illness. And that's the basis of Western medicine."

Many Hippocratic ideas were adopted by the Romans, and some of the Empire's top physicians were themselves Greek. The Romans made great leaps in hygiene and public health, showing an understanding of the need to keep clean. This is evident in the ingenious water supply systems they constructed, with aqueducts to carry clean water into towns.

The intensity of Roman warfare saw developments in battlefield surgery, too, and they developed a variety of surgical instruments, such as scalpels and bone levers. Each Roman legion had its own medical personnel, capable and willing to

Among the preserved treasures found at Pompeii is a collection of around 40 surgical tools

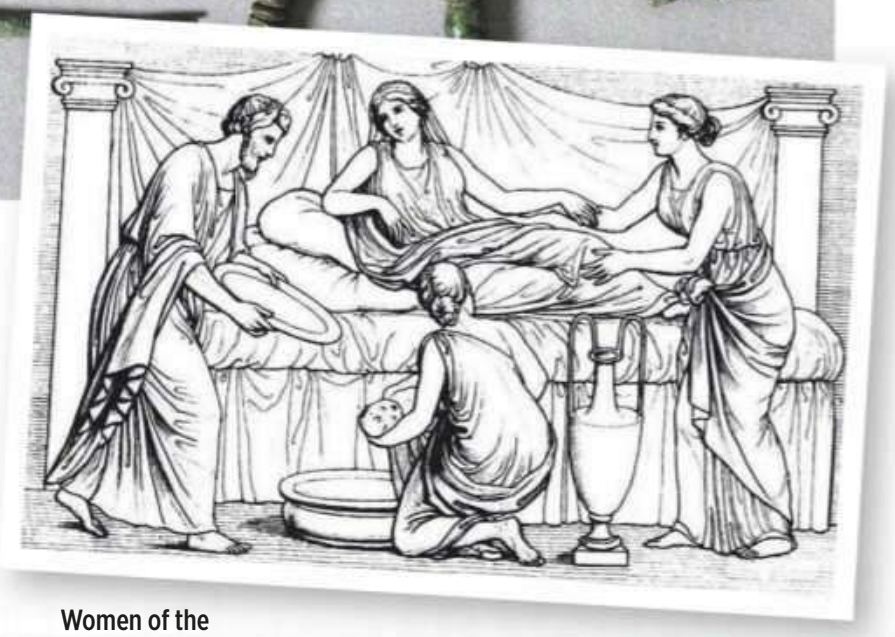
**CUTTING EDGE**
Much like today, Roman scalpels came in various sizes. Many of these instruments were similar to those used well into the 19th century.

**STAY SHARP**
Among the bronze and steel surgical instruments unearthed at Pompeii is this pair of scissors. Ensuring an edge sharp enough for surgery was difficult so they were more often used to cut hair.

learn more sophisticated methods from the peoples that they conquered.

As Christianity spread through the West, this, too, changed the way that sickness was understood and charitable caring for the sick an important part of Christian belief saw the creation of hospitals for those unable to afford medical care.

Ancient midwifery was an occupation mainly reserved for women, and the training of midwives is mentioned in the Hippocratic texts. However, there is not much information about what midwives did or exactly who they were. On a local level, it is likely that specific women would be recognised as a person to call when a baby was on its way, and there would be those who had special knowledge of herbs and remedies. The word 'caesarian' refers to the myth that Roman emperor Julius Caesar was born using this procedure, but it is unlikely to have been performed in the ancient world.



Women of the ancient world had few vocations open to them, except for midwifery and healing

## DOCTOR OR QUACK?

No qualifications were needed to practise as a physician, and the profession was not regulated. In the fifth century BC an Oath was written now known as the Hippocratic Oath – which saw practitioners swear by Apollo, Hygieia, Asclepius and Panacea to respect their teacher and not to administer poison, abuse patients, use a knife or break the confidentiality between patient and doctor. In reality, it's unclear how much weight the Oath actually carried or how widely it was used in its time. Nevertheless, it exists in various forms today as part of many medical graduation ceremonies.

# MEDICINE IN MEDIEVAL TIMES

## The Catholic church had a profound influence on the care of patients during the Middle Ages – but the West was also turning to the Islamic world for inspiration

**WORDS: EMMA SLATTERY WILLIAMS**

The fall of the Roman Empire ushered in the medieval period in Europe, a period which saw plagues ravage and people were helpless to stop the spread of disease, with many eking out a harsh and uncomfortable existence under feudal systems.

Some historians have traditionally referred to the early medieval period as the 'Dark Ages' – although there is a movement to change this way of thinking. In terms of medicine, though, surviving source material is scant and there isn't a great deal of evidence to suggest that medicine evolved much beyond the teachings of the ancient Roman and Greek empires. Indeed, according to Professor Mary Fissell, early medieval medicine was "frankly not super-sophisticated".

Early medieval medicine often focused on herbal remedies and charms, and the works of ancient physicians – in particular that of Hippocrates and Galen – were still closely followed and taken to be accurate, but as human dissection had been banned in the Roman Empire, Galen had based most of his scientific findings on the anatomy of animals. It wouldn't be until the early 16th century that human dissection would be fully utilised as a way of learning about the body – and even then, it was sometimes seen as controversial.

**"It was logical for people to believe that God had decided to make them ill in the first place"**

Another key factor behind the lack of progress in medieval Europe was down to the simple problem of disseminating material. The printing press wouldn't be developed by Johannes Gutenberg until the 15th century, so scientific ideas were slow to spread, and texts were written by hand. What's more, the majority of the population was illiterate – members of the clergy and nobility were often the only people who could read.

To some extent, medicine in medieval Europe operated within the confines of the Church, with healthcare provided by monasteries. In the High Middle Ages, hospitals caring for the sick and infirm were founded, run by religious orders.

GETTY IMAGES X4, ALAMY X2

ABOVE: **An image depicting the Schola Medica Salernitana, a centre for medical learning in the 9th and 10th centuries**
RIGHT: **Christ shown alongside men representing the four temperaments associated with the 'four humours' (melancholic, sanguine, phlegmatic, choleric), 1486**

ABOVE: **A 13th-century fresco depicts antiquity's two biggest medical giants: Galen (*left*) and Hippocrates (*right*)**

RIGHT: **Bloodletting was a common practice, as seen in this c1350 image**

People used relics, prayed to saints to intercede for them to cure illness or speed delivery, and went on pilgrimages to holy sites – an early form of medical tourism.

In the 10th century, Salerno emerged as a site of medical learning, a place where Greek Arabic, and Latin learning intersected. In the 12th century, universities began to be founded all across Europe. At first they trained clerics, but quickly expanded to law and medicine. Learned physicians now studied Latin and women were excluded from such training.

## LOOKING EAST

So, what were your options if you were ill in the medieval world? While there were physicians you could visit if you had the money, most ordinary people relied on local healers and apothecaries with knowledge of herbs and plants. But when it came to what was actually *making* you ill, a variety of different causes were blamed. Many believed that living a sin free, godly life was key to good health, while others blamed planetary alignments or witchcraft for their maladies.

Bad smelling air 'miasma' was a common theory as to causes of disease. During plague outbreaks, some efforts were made to keep towns cleaner, and although this didn't provide a cure, it certainly helped keep citizens in better health. Similarly, the concept of the 'four humours' was still important in medicine, just as it had been in antiquity. To this end, bloodletting and other ways of purging the body were practised as physicians sought methods to bring the humours back into balance.

Most of the more forward thinking medical innovations of medieval Europe, however, were driven from the East, as Fissell explains: "Medicine in the Islamic world was actually a lot more sophisticated than that in Europe. During the 9th and 10th centuries, the Islamic world saw a growth in sophisticated hospitals, as well as developments in surgery. It was a really lively place intellectually."

Over the course of the 11th and 12th centuries, many of these ideas were brought into western Europe, allowing access to previously unknown ideas: "There was an influx of new learning as medical texts were translated. Arab surgical techniques really kickstarted surgery as a more specialised kind of work."

Furthermore, the development of universities saw the beginnings of medical regulation, and the job of 'physician' evolved into a fully fledged and licensed career: "Medicine, along with religion and law, became one of the three main faculties of these early universities", continues Fissell. "In some cities, the university's faculty of medicine would be granted power by the local government to regulate who got to practise. It's the first time we can see a division between who was trusted and qualified to practise medicine, and who was not."

Continues on p38

## BLACK DEATH

### Inside history's deadliest pandemic

A hastily made lead cross from the grave of a London monk killed by the Black Death

The Black Death arrived in England in around 1347/8 – having first spread through China and India before coming to Europe. Today, scientists believe it was caused by the *Yersinia pestis* bacteria, but at the time, people had no idea what was causing it and as thousands died around them, believed the end of the world was coming.

Bubonic plague, the most common form of plague, saw those infected come out in painful swellings (buboes) and suffer from fevers and headaches before death claimed them, usually within a few days. The disease spread from house to house and village to village, and soon, everyone knew someone who had been affected. Fissell says: "Plague came as a tremendous shock to medieval society. Medicine was basically powerless; people could do nothing."

Today it's thought that fleas carried the disease and spread it to humans, probably via rats who stole away on ships, spreading it from port to port. As many as 50 million people across Europe and up to 40 per cent of England's population are thought to have died from the Black Death; the disease would frequently reappear, especially in crowded cities, every few decades for centuries.

A range of reasons for plague were given: from foul-smelling air, to curses from witches. The finger was even pointed at Jewish communities, who were accused of poisoning wells. To the deeply religious medieval society, however, the most logical explanation was that plague had been sent as a punishment from God for their sins. Church services increased as people desperately prayed for forgiveness and an end to their suffering, while others went on pilgrimages to holy sites and monasteries.

Even the universe was looked to for answers, according to Fissell: "When the medical faculty in Paris was asked by the government to explain what was happening, they blamed poisonous air caused by a bad conjunction of the planets. Astrology was a big part of medical science during the medieval period."

Thousands of Jewish men and women were massacred during the Black Death, accused of spreading the disease by deliberately poisoning wells

# DIAGNOSIS AND TREATMENT

## Leeches, vipers and spiderwebs were what the doctor ordered

If you were unlucky enough to become unwell in the medieval period, there were a whole host of treatments available – albeit with varying results.

Although their scientific knowledge may have been limited, medieval physicians did understand that keeping active and healthy could prevent disease. Regular exercise was seen to be beneficial, and guides recommending it can be found as far back as the 14th century. To combat suspected disease in the air, pleasant-smelling herbs and flowers were recommended by apothecaries to keep away the miasma.

When attending a sick person, examination of the patient's urine was often a medieval physician's first port of call. Like modern medicine, medieval doctors understood that urine offered important clues about what was happening deep inside the body. While we focus on biochemistry, they saw evidence of the imbalance of the four humours in the various colours of urine.

As the theory of the four humours still reigned supreme, bloodletting was a common medical prescription. Doctors either used lancets to open a vein and let blood, or used leeches to bleed a patient a bit more gradually.

ABOVE: **Some doctors believed medicine and astrology were intrinsically linked**

LEFT: **Physicians ponder over the course of treatment for a 16th-century patient**

Charms and amulets were often used to ward off sickness and disease. The movements of the stars and planets were thought to influence everything on Earth, too – from the weather to the body. Physicians often consulted a diagram known as 'Zodiac Man' (*pictured above right*), which explained how astrological formations could interfere with the body and cause illness.

In terms of other remedies offered, medieval people used a wide array of herbal preparations. While some, such as theriac, an expensive preparation made from dozens of herbs and the flesh of vipers, would not win approval today, other medieval remedies had surprising virtues. Spider-webs, for example – which were occasionally used to treat wounds – have naturally occurring antiseptic and antifungal properties and could therefore stave off infection.

**DID YOU KNOW?**

**STITCHED UP**

Although women were banned from university and couldn't qualify as physicians, some did undertake apprenticeships and train as surgeons. However, when the medical professions were formalised in the 17th century, women were excluded.

# SURGERY

## From the barbershop to the battlefield, medieval operations could be tortuous – and pretty messy

Medieval surgeons were trained by guilds, which had strict rules about who could practise, rules that cities were happy to back up with prosecutions. Some surgery was performed by people known as 'barber surgeons', which means exactly what it sounds like: the man who cut your hair could also amputate your leg or pull out a tooth. This is where the colours on a barber's pole come from – the red and white representing blood and bandages.

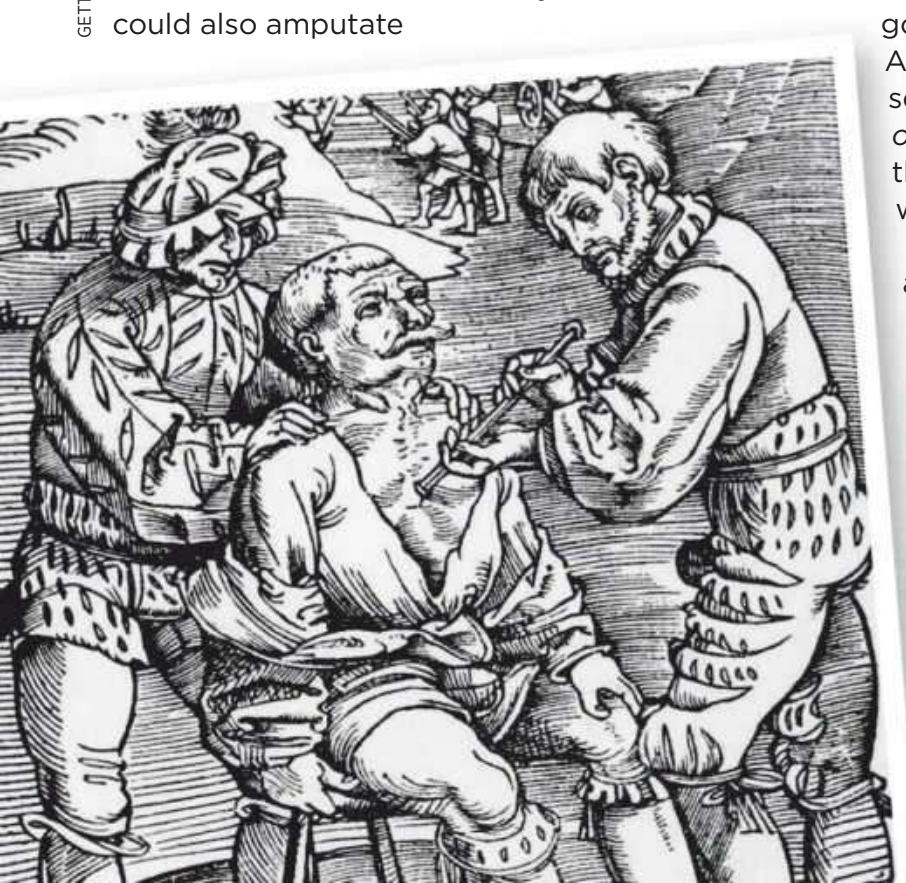
Today, surgeons are known as 'Mr', 'Ms' or 'Mrs' rather than 'Dr' – a practice that goes all the way back to the Middle Ages. While doctors studied for several years at university (*see opposite page*), surgeons began their training as apprentices and were seen as being less educated.

Internal surgery was limited as it was impossible to perform without anaesthesia and asepsis, but surgeons could heal ulcers and wounds and sometimes even remove bladder stones. Cataract surgery, performed with a needle to remove the clouded lens, was painful but might restore sight to someone who had gone blind.

Anaesthetic wasn't a luxury medieval people had – the only option was to bite down on something to stop you gnawing your tongue and hope the pain would knock you out. Opium and herbs such as hemlock could make patients drowsy, but there was also the risk of putting people to sleep permanently.

The countless wars fought during the medieval period gave surgeons plenty of opportunities to hone their skills. During the battle of Shrewsbury in 1403, Prince Henry (later Henry V), was shot in the head with an arrow. John Bradmore, a skilled surgeon, devised a pair of forceps to remove the arrowhead, which was embedded in the prince's skull. He then covered the wound in honey and wine to prevent infection, later writing a thesis – *Philomena* – on his techniques.

Elsewhere, the Siege of Málaga, in 1487 saw basic ambulances first used, with wagons transporting wounded soldiers from the battlefield.



**A barber surgeon gets to work on a soldier suffering from an arrow injury in an image dated c1517**

GETTY IMAGES X4, WELLCOME COLLECTION X1

# PUBLIC HEALTH

## Towns became cleaner – but being a 'gong farmer' wasn't much fun

It's now widely thought that medieval English towns were often cleaner places to live than the industrial cities of the 19th century. The fear of plague (often believed to be caused by 'bad air') saw regular attempts to clean up urban areas, and in 1388, England's parliament passed its first law banning the disposal of waste and rubbish into rivers and other watercourses. A sure contender for one of the worst jobs in history was the medieval gong farmer, who removed human waste from public latrines and cesspits.

Many towns would have had public bath houses – though not as luxurious as their ancient Roman counterparts, they still helped keep people clean. Physicians believed that a good level of personal hygiene could ward off diseases, and some homes would have even had their own wooden bathing tubs.

Due to the reoccurrence of plague, moves were made to try and limit the spread of infection. In the 14th century, Venice began quarantining ships that arrived in its port. In total, sailors were forced to wait in the lagoon for 40 days (*quaranta giorni*) before being allowed to disembark, which is where our word "quarantine" comes from. Such quarantine laws were later adopted across Europe, on dry land as well as on ships. In mid 16th-century London, for example, plague-affected homes were put under quarantine and their doors marked with blue crosses.

"It was during times of plague that we see the advent of early public health measures", says Professor Mary Fissell, "especially in the Italian cities, where they start creating quarantines and boards of health that regulate them. These officials ensured that no bodies were left in the streets, because they had a theory that if something was left to decay outdoors, it would create bad air, which in turn was thought to cause disease. As the plague returned at various intervals throughout the medieval period, boards of health built temporary hospitals outside the cities. They tried to move towards isolation and containment in ways that they hadn't tried before."

Bath houses were the ideal place to get clean – although they were also associated with loose morals

## BIG NUMBERS

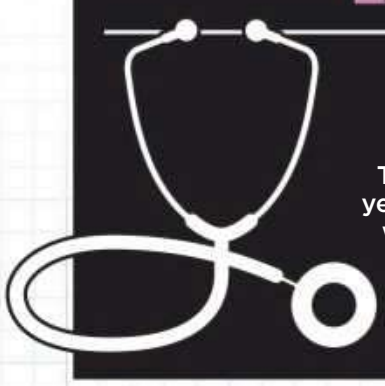
Statistics from the world of medieval medicine

**20-30%**

of children died before their first birthday

**30-35**

The average life expectancy in the 1350s



**7**

The number of years a physician would train at university

# HOSPITALS AND UNIVERSITIES

## New institutions tended to the sick and helped train physicians

Hospitals assumed a new importance in the Middle Ages, as charitable and religious institutions, where those too old or ill to look after themselves could be cared for by monks and nuns. But those suffering from infectious diseases, such as leprosy, would often not be admitted.

St Bartholomew's Hospital in London was originally founded as part of the Priory of St Bartholomew's in 1123, and still exists today, making it the oldest continually operating hospital in England (that is still on the same site). Other hospitals were later established by local guilds and would only contain a few beds, while others were used for specific ailments such as leprosy.

Like today, physicians underwent formal medical training at university, but only the very wealthiest members of society could afford to attend them. Indeed, by 1300 there were only around 100 qualified physicians in England.

As part of their seven-year training, physicians would study the texts of renowned ancient scholars such as Hippocrates and Galen, as well as translations of works by Arab doctors such as Ibn Sina. Professors wrote commentaries on these older texts, updating or even questioning the knowledge in them.

But although medieval medicine may seem primitive to modern eyes, it did mark the start of physicians needing to be licensed in order to practise. Surgeons and apothecaries had their education and practice regulated by guilds, which examined practitioners to make sure they were up to scratch. ⊙

An 18th-century view of St Bartholomew's Hospital, London, originally founded as a part of an Augustinian priory in 1123

# 6 SURPRISING FACTS ABOUT THE HISTORY OF MEDICINE

How did people in the past treat illness, injury and disease? **Caroline Rance** shares a selection of remarkable case studies from around the globe – from the first general anaesthetic to early caesareans and medicinal leeches...

# 1 CATARACT SURGERY WAS POSSIBLE IN THE 6TH CENTURY BC

One of the oldest known medical textbooks is the *Sushruta Samhita*, written in Sanskrit in India. Its exact date is tentative, as no original version survives and it is only known from later copies, but the current consensus is that it was written in around 600 BC. Sushruta is thought to have been a physician and teacher working in the north Indian city of Benares (now Varanasi in the state of Uttar Pradesh). His *Samhita* – a compilation of knowledge – provides detailed information on medicine, surgery, pharmacology and patient management.

Sushruta advises his students that however well read they are, they are not competent to treat disease until they have practical experience. Incisions, he said, were to be tried out on the skin of fruits, while extracting fruit seeds enabled the student to develop the skill of removing foreign bodies from flesh. They also practised on dead animals and on leather bags filled with water, before being let loose on real patients.

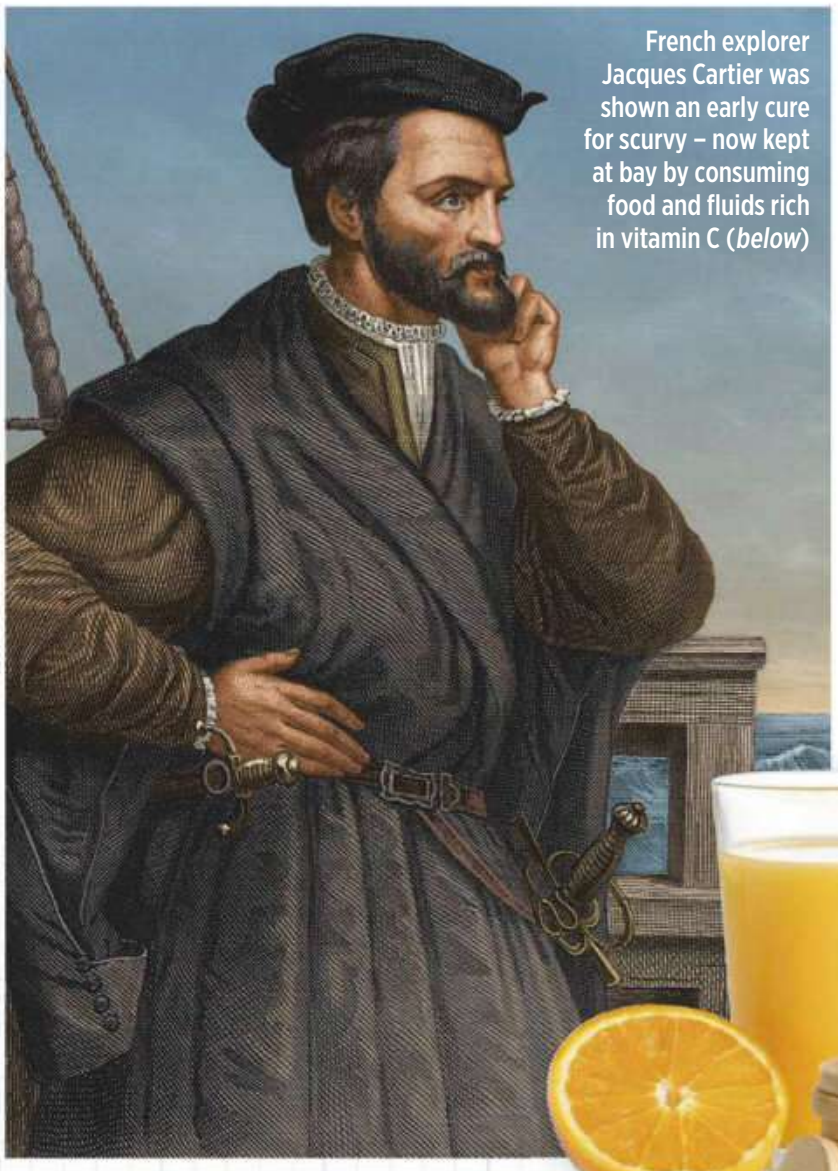
Among its many surgical descriptions, the *Sushruta Samhita* documents cataract surgery. The patient had to look at the tip of his or her nose while the surgeon, holding the eyelids apart with thumb and index finger, used a needle-like instrument to pierce the eyeball from the side. It was then sprinkled with breast milk and the outside of the eye bathed with a herbal medication. The surgeon used the instrument to scrape out the clouded lens until the eye "assumed the glossiness of a resplendent cloudless sun".

During recovery it was important for the patient to avoiding coughing, sneezing, burping or anything else that might cause pressure in the eye. If the operation were a success, the patient would regain some useful vision, albeit unfocused.

An Indian man with cataracts in his eyes. The condition is still a major cause of blindness in many parts of the world today

Excerpts from a copy of the *Sushruta Samhita*, which details a primitive form of cataract surgery

# 2 A 'TREE OF LIFE' TACKLED SCURVY



French explorer Jacques Cartier was shown an early cure for scurvy – now kept at bay by consuming food and fluids rich in vitamin C (*below*)

Trapped in ice near Stadacona (the site of present-day Quebec City) in 1536, Jacques Cartier's ships weren't going anywhere. The crews, holed up in a makeshift fort with little access to fresh food, came down with a disease so gruesome that "their mouth became stincking, their gummes so rotten, that all the flesh did fall off, even to the rootes of the teeth, which did also almost all fall out". They had scurvy, now known to result from a deficiency of vitamin C. Cartier had no idea what to do.

During the course of his first voyage to Stadacona in 1534, Cartier had kidnapped two young men, Dom Agaya and Taignoagny, taking them back to France as proof that he had discovered a new territory. Now that they were home, the men and their community had every reason not to trust Cartier – an attitude that he interpreted as "treachery" and "knavery".

In spite of this tension, Dom Agaya showed Cartier how to make a decoction from a tree called "Annedda" and, although the Frenchmen wondered if it were a plot to poison them, a couple of them gave it a go and were cured within days. After that, there was such a rush for the medicine that "they were ready to kill one another", and used up a whole large tree.

The identity of Annedda is not certain but there are several candidates, including eastern white cedar and white spruce. Whatever it was, its nutritional benefits resulted in the sailors' complete cure.

Cartier repaid Dom Agaya by kidnapping him again along with nine others. By the time of Cartier's next voyage, most of the prisoners were dead, but Cartier informed their relatives that they were living in style in France. The scurvy cure did not gain widespread recognition and the disease continued to claim sailors' lives for another 200 years. ▶

GETTY IMAGES X4, ALAMY X2

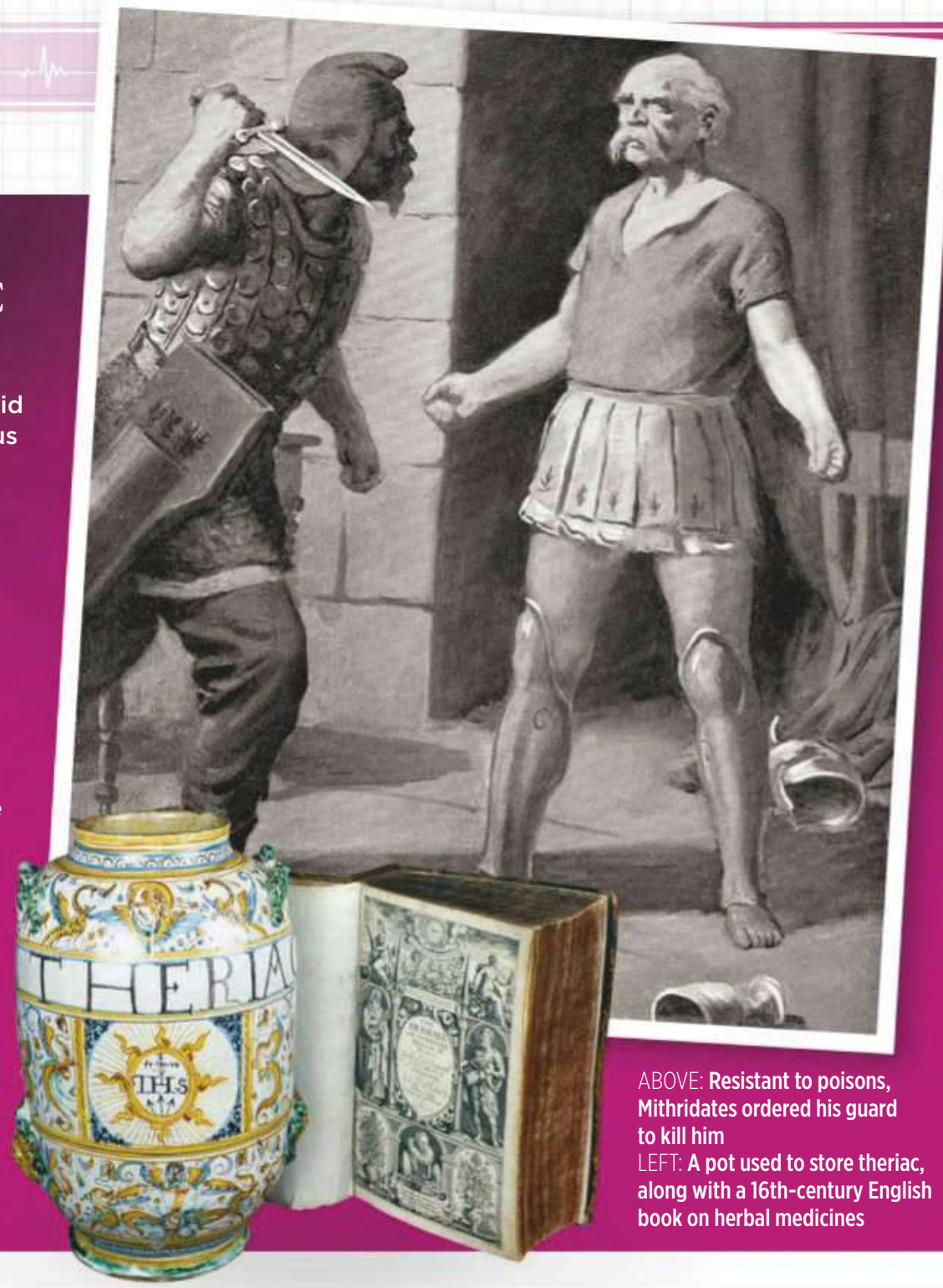
# 3 IF YOU WANT A CURE FOR EVERYTHING, TRY THERIAC

Being a king in ancient times was exhaustingly dangerous; there was always someone plotting to get rid of you. So, according to legend, Mithridates VI of Pontus (on the shores of the Black Sea in what is now Turkey) attempted to become resistant to poisons by taking gradually increasing doses. He was also reputed to have conducted experiments on condemned prisoners, culminating in the creation of mithridate – a medicine that combined all known antidotes in one formula.

It didn't work against Roman armies, however, and when Mithridates was defeated by the military leader Pompey in 66 BC, the recipe supposedly arrived in Rome. Emperor Nero's physician Andromachus developed it into a 64-ingredient composition, which became known as theriac. Most of the ingredients were botanical (including opium), but viper's flesh was a notable component.

In spite of early scepticism, theriac took off as a prized (and expensive) cure-all. By the 12th century Venice was the leading exporter and the substance had a high profile in European, Arabic and Chinese medicine alike. Its fortunes waned after 1745, however, when William Heberden debunked its alleged efficacy and suggested that enterprising Romans had exaggerated the Mithridates story for their own gain.

Even so, theriac remained in some European pharmacopoeias until the late 19th century.




ABOVE: **Resistant to poisons, Mithridates ordered his guard to kill him**
LEFT: **A pot used to store theriac, along with a 16th-century English book on herbal medicines**

# 4 GENERAL ANAESTHESIA WAS USED IN JAPAN DURING THE EARLY 1800s

Kan Aiya, a 60-year-old woman, had lost many loved ones to breast cancer. She had seen her sisters die of the cruel disease, so when a tumour formed in her left breast she was well aware of the likely outcome.

For her, however, there was fortunately a small chance of survival. It was 1804 and Kan Aiya was in the best possible place for surgery – feudal Japan.

Seishū Hanaoka (1760–1835) studied medicine in Kyoto and set up a practice in his hometown of Hirayama. He became interested in the idea of anaesthesia owing to stories that a third-century Chinese surgeon, Houa T'o, had developed a compound drug enabling patients to sleep through the pain. Hanaoka experimented with similar formulae and produced *Tsusensan*, a potent hot drink.

Among other botanical ingredients it contained the plants *Datura metel* (aka *Datura alba* or 'devil's trumpet'), *Angelica decursiva* and monkshood, all of which contain some potent physiologically active substances.

*Tsusensan* had quite a kick, and if you glugged it down willy-nilly you would probably die, but in the correct dosage it rendered patients unconscious for between six and 24 hours, allowing ample time for surgery.

On 13 October 1804, Hanaoka excised Kan Aiya's tumour after she had taken a dose of *Tsusensan*; he would go on to operate on at least 150 more breast cancer patients and people with other conditions. Sadly, Kan Aiya is thought to have died of her disease the following year, but had been spared the agony that still characterised surgery in the West.

**Illustrations from a medical casebook by Seishū Hanaoka, who successfully operated on cancer patients using general anaesthesia**

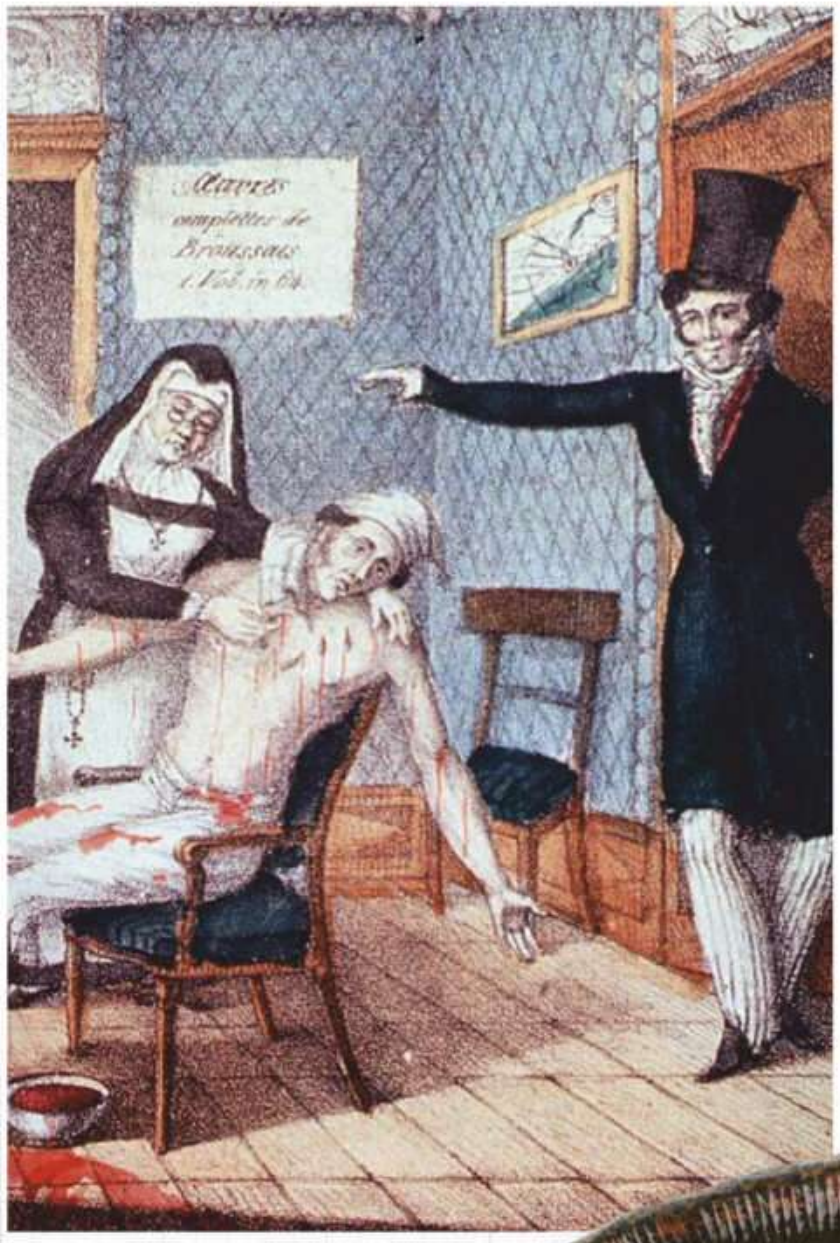
GETTY IMAGES X4, ALAMY X3

# 5 A ‘LEECH CRAZE’ HIT 19TH-CENTURY EUROPE

The medicinal leech has been in use for thousands of years, and is even today considered to be a way of restoring venous circulation after reconstructive surgery. But it was in the early 19th century that the leech really soared in popularity. Led by French physician François-Joseph-Victor Broussais (1772–1838) – who postulated that disease stemmed from irritation of the gastrointestinal tract that passes to other organs “sympathetically” and was treatable by bloodletting – the ‘leech craze’ saw barrels of the slippery creatures shipped across the globe, wild leech populations decimated almost to extinction, and the establishment of prosperous leech farms.

Leeches had advantages over the common practice of bloodletting using a lancet – the loss of blood was more gradual and less of a shock for those of delicate constitution. And because Broussais’s followers used leeches in place of all the other medicines at the 19th-century physician’s disposal, patients were spared some harsh remedies that might otherwise have made them feel worse.

In 1822, a British surgeon called Rees Price coined the term sangui-suction for leech therapy.

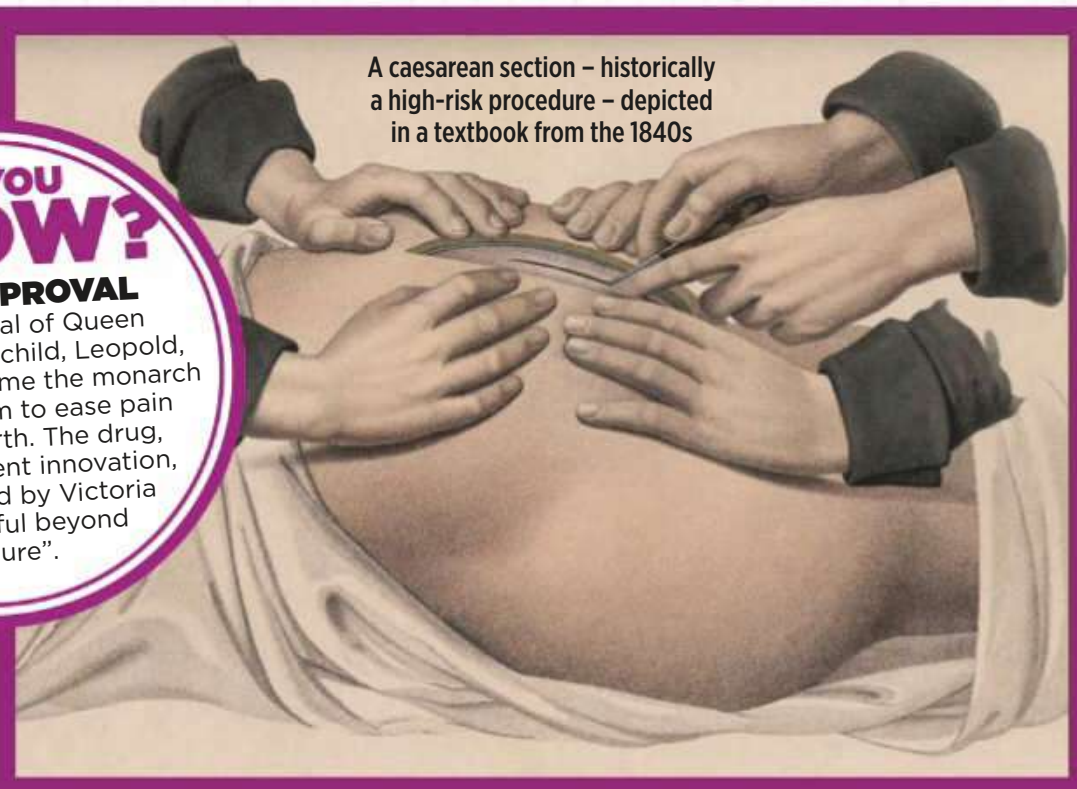


Leech pioneer François-Joseph-Victor Broussais (*above, wearing top hat*) helped popularise the use of these bloodthirsty creatures (*right*)

**DID YOU KNOW?**

**ROYAL APPROVAL**

The 1853 arrival of Queen Victoria’s eighth child, Leopold, marked the first time the monarch used chloroform to ease pain during childbirth. The drug, a relatively recent innovation, was described by Victoria as “delightful beyond measure”.



A caesarean section – historically a high-risk procedure – depicted in a textbook from the 1840s

# 6 UGANDAN SURGEONS DEVELOPED LIFE-SAVING CAESAREAN OPERATIONS

In 1884, the caesarean section was not a new idea. It dated from the time of the Caesars, when Roman law required the procedure to be carried out in the event of a woman’s death in childbirth.

Over the centuries, reports occasionally surfaced of caesarean sections saving the lives of both mother and baby, but even after the introduction of antiseptic methods and anaesthesia, caesareans remained a dangerous last resort. So Edinburgh surgeons were surprised to hear a lecture by Robert Felkin, a missionary doctor, about a successful operation that he had witnessed in the African kingdom of Bunyoro Kitara in Western Uganda five years earlier.

The operation, Felkin reported, was carried out with the intention of saving both lives. The mother was partially anaesthetised with banana wine. The surgeon also used this wine to wash the surgical site and his own hands, suggesting awareness of the need for infection control measures.

He then made a vertical incision, going through the abdominal wall and part of the uterine wall, before further dividing the uterine wall enough to take the baby out. The operation also involved removing the placenta and squeezing the uterus to promote contraction.

The means of dressing the incision was also highly developed: the surgeon used seven polished iron spikes to bring the edges of the wound together, tying them in place with bark-cloth string. He then applied a thick layer of herbal paste and covered this with a warm banana leaf held in place with a bandage. According to Felkin’s account, the mother and her baby were still doing well when he left the village 11 days later.

Although caesarean operations had been performed in Africa by white surgeons before this date, the procedure appeared to have been developed independently by the Banyoro people – a somewhat discomfiting realisation for a British audience familiar with colonial tales of ‘savages’. ⊙

## GET HOOKED

**READ**

Caroline Rance is an author and historian. Her books include *The Quack Doctor: Historical Remedies for All Your Ills* (The History Press, 2013) and *The History of Medicine in 100 Facts* (Amberley, 2015). Visit her website: *thequackdoctor.com*

# A MEDICAL RENAISSANCE?

## The end of the medieval period heralded an age of medical discovery, where physicians challenged accepted theories and explored new medical substances from around the world

**WORDS: EMMA SLATTERY WILLIAMS**

The Renaissance, the Age of Enlightenment and scientific and technological revolutions: the early modern period, roughly defined as the late-15th to late-18th centuries, saw a shift away from medieval thinking. And the field of medicine was no different. Physicians questioned theories of ancient minds like Galen and Hippocrates, which had been the bedrock of Western medicine for millennia, and made new discoveries, practices and treatments.

This medical 'renaissance' led to new understanding of the circulation of the blood, anatomy, the causes and effects of disease and surgery to name a few. The treatment of battlefield wounds improved – constant wars and fighting throughout these centuries meant surgeons had plenty of opportunity to try new things and benefited from new studies of anatomy.

Nevertheless, life expectancy remained low and diseases, notably plague, were still rife. Conditions may, in fact, have been worse than the medieval era at times, due to the growth of cities, where sanitation was poor. Voyages of discovery brought new remedies to Europe but transported infectious diseases like smallpox to the New World, creating huge mortality in populations unfamiliar with these diseases.

New world plants like sarsaparilla and snakeroot were brought back to Europe and eager adopted. Tobacco, too, was brought from the New World to the Old, initially as a kind of cure-all for any number of ailments. Quickly it left medicine behind to become the recreational substance we know today.

The theory of the humours continued to shape learned medicine's approach to healing. Bloodletting and purges were the mainstays of therapy. Prayers and charms remained regular preventative measures to keep disease and death at bay, and some people turned to the monarch rather than medical professionals for healthcare.

The 'king's touch' was a much-vaunted ceremony in France and England, where it was believed that a monarch laying their hands on the sick would cure them of the 'king's evil', or scrofula (a form of tuberculosis that could go away on its own). Charles II of England is thought to have performed the touch on as many as 90,000 people. Ordinary folk who might not be able to afford a university educated physician relied on domestic medicine. Many ailments get better on their own, and careful nursing at home helped many people survive episodes of illness.

**"It was believed that a monarch laying their hands on the sick would cure them of scrofula"**

### QUACKS AND QUESTIONING

Trained and trustworthy physicians were expensive so only the wealthy could benefit from their wisdom. Most people got medicine and medical advice at the apothecary's shop, or made their own medicines with herbs gathered locally or purchased at the market. However, new kinds of commercial practitioners also began vying for custom. They sold new and exciting remedies, already packaged up, sometimes with pamphlets of information for the users. Such practitioners were often labelled "quacks" by the learned physicians who

A quack doctor extracts a patient's tooth in this 17th-century painting by Flemish artist, Theodoor Rombouts

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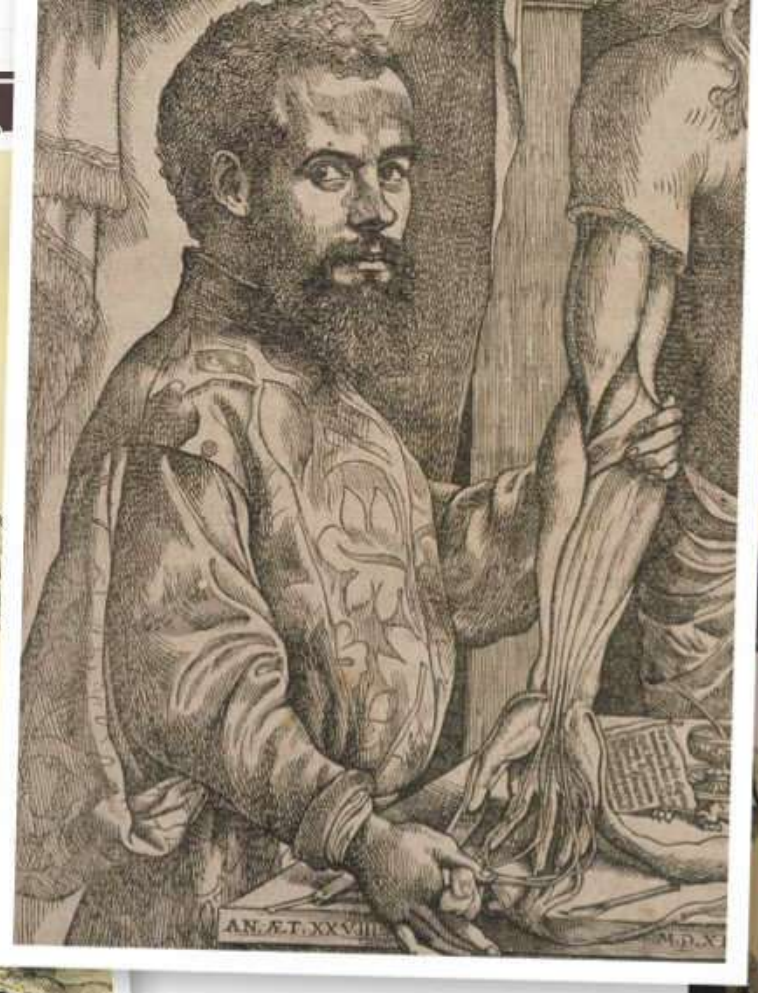
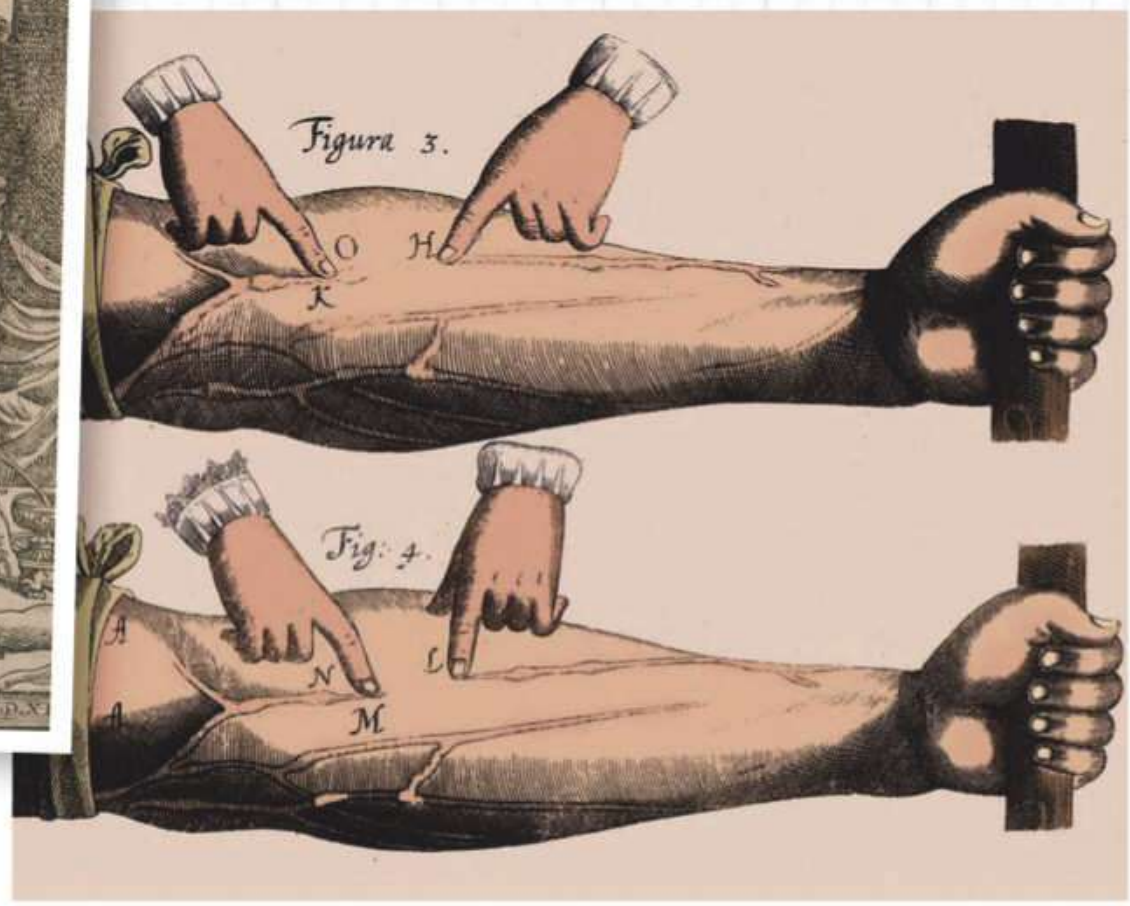





LEFT: **Andreas Vesalius's anatomical treatise *On the Fabric of the Human Body* changed the way people saw the body**

CENTRE: **With his many dissections, Vesalius challenged views going back to ancient times**

RIGHT: **A diagram from William Harvey's famous studies into the circulatory system, published in 1628**

did not like the competition; Britain did not pass comprehensive laws to control who could hand out medical advice until the mid-19th century.

At the same time as the so-called quacks, however, more people than ever were showing an interest in scientific understanding thanks to the advent of the printing press. This enabled medical texts to spread quickly across Europe. Professor Mary Fissell suggests that with access to more texts came the initiative to be more questioning. "Physicians began to get critical about what they were reading, and more sophisticated with it," she says. "For the first time, people were saying, 'This classical authority isn't quite right for where I am.'"

For centuries, dissecting the human body was viewed as a desecration. Although, Fissell points out that the idea the Catholic Church banned it was a myth: "It came from surgeons and anatomists wanting to portray themselves as heroic battlers against superstition. A pope decreed something in 1215, which has been misread again and again as the church being against dissection," she says. "The church didn't like surgeons sneaking into graveyards at night and digging up bodies. That was desecration, after all. The problem was with how they got the bodies, not with the practice of dissection itself."

Physicians became more curious and willing to study inside the human body ▶

## PIONEERING MEDICAL MINDS

### Four men whose innovations and discoveries changed our understanding of the human body

**AMBROISE PARÉ**

French medical pioneer Ambroise Paré (1510–90) began his career as an apprentice barber surgeon in Paris, before spending 15 years perfecting his techniques on Europe's battlefields. Wounds had traditionally been cauterised using oil, but Paré created his own mixture that worked much better. He also invented tied ligatures to stop bleeding during amputations, as well as new types of artificial limbs.

**WILLIAM HARVEY**

The studies of William Harvey (1578–1657) into the body's circulatory system was a gamechanger. The personal physician to James VI & I and his son Charles I, Harvey was the first to prove that the heart acts like a pump and circulates blood around the body. Until this point, the humoural theory model that the liver was responsible for producing and distributing blood had been universally accepted.

**ANDREAS VESALIUS**

Born in Brussels, Andreas Vesalius (1514–64) became a professor of surgery and anatomy at Padua University aged just 22. He insisted that his students should undertake human dissection so they could fully understand how the body works. His 1543 treatise *On the Fabric of the Human Body* included accurate anatomical drawings and showed that the ancient scholars of Greece and Rome were not infallible.

**PARACELSUS**

Swiss physician and alchemist Paracelsus (1493–1541) rejected the works of Galen, despising the ancient physician so much that he publicly burnt some of his books. Paracelsus claimed there were three basic substances: salt, sulphur, and mercury, disputing the theory of the four humours. He is best known for pioneering the use of chemicals in medicine. For this, he is sometimes referred to as the 'father of toxicology'.

# CURIOUS HOME REMEDIES

**Far from being helpful, some of the items found in an apothecary's medicine cabinet could often be a hindrance and even downright dangerous**

## POISON PILLS

Patients with syphilis were sometimes prescribed highly toxic amounts of mercury and arsenic. Despite the dangers, the practice didn't stop until the 20th century.

## WITH THE HELP OF THE DEAD

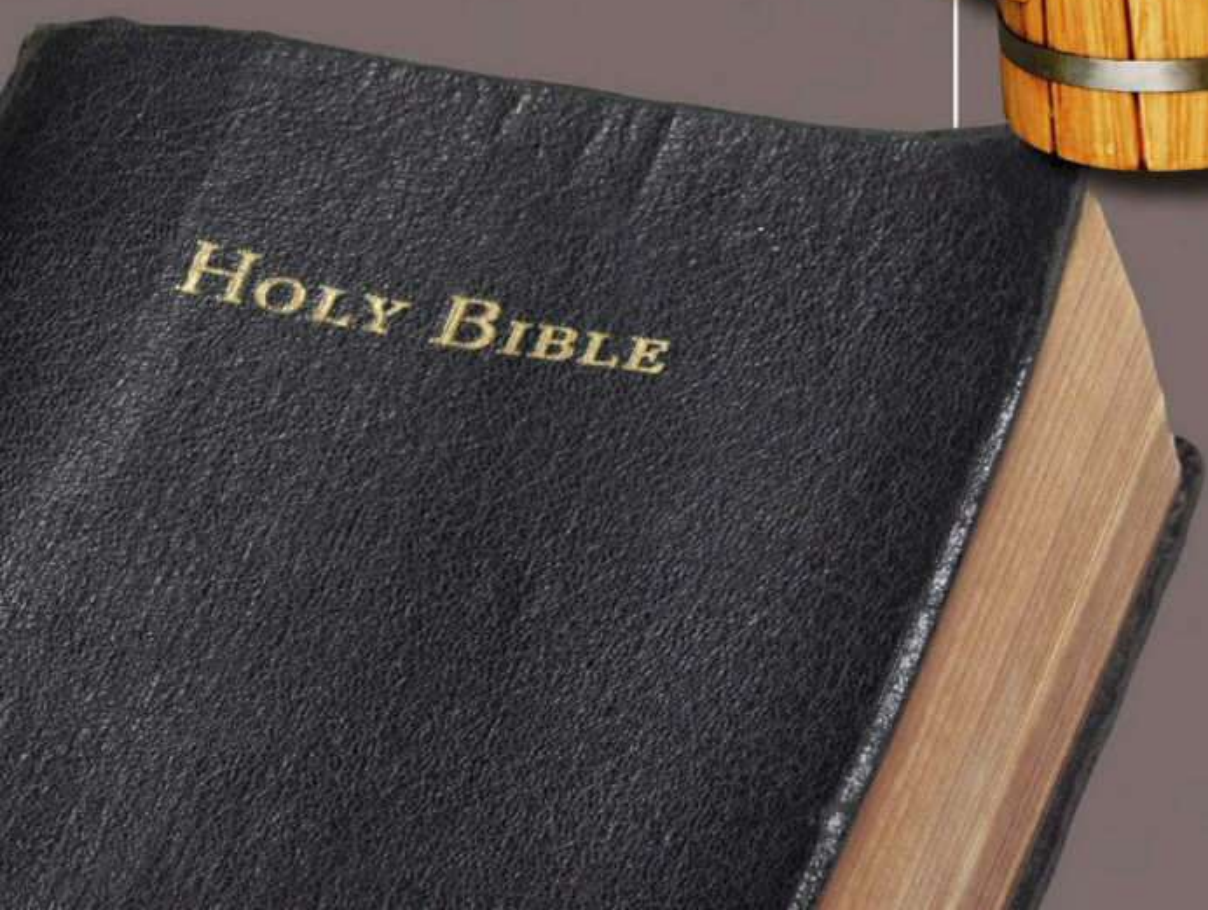
Some doctors utilised dead bodies to help 'cure' the living. Epilepsy patients were given medicine made using skulls taken from burial grounds, while ground-up remains of ancient Egyptian mummies were sometimes administered to those with asthma and tuberculosis.

## PUNGENT PINTS

Certain types of sickness were thought to be eased by ingesting cow dung, which was dried into a powder and added to beer.

## THE POWER OF THE DIVINE

It should come as no surprise that people looked to the heavens for solutions to their maladies. It was common to repeat Bible passages and rhymes to cure everything from bleeding to burns.



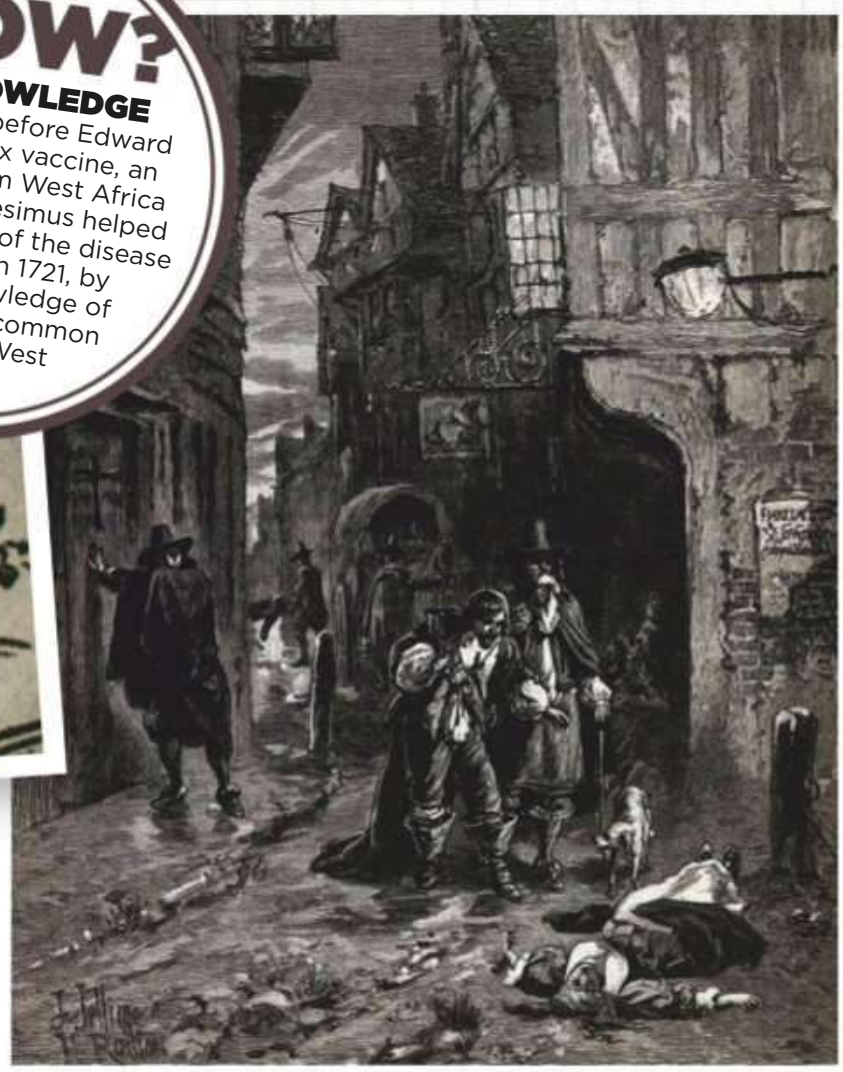

## BOTTOMS UP!

If you suffered from bladder problems in the 17th century, one suggested remedy was wine mixed with garlic, crab eyes and the powdered penis of a stag.

**DID YOU KNOW?**

**PRIOR KNOWLEDGE**

Nearly 80 years before Edward Jenner's smallpox vaccine, an enslaved man from West Africa known only as Onesimus helped prevent the spread of the disease in Boston, US, in 1721, by sharing his knowledge of inoculation – a common practice in West Africa.



ABOVE LEFT: **A 17th-century engraving shows Londoners fleeing the Great Plague in the presence of the 'Angel of Death'**

ABOVE: **Plague victims' bodies could lay in the streets for days**

**"The Great Plague ravaged London, killing 100,000 people, and the medical world was powerless"**

and, in 1543, the anatomist Andreas Vesalius published his epochal work, *De Humani Corporis Fabrica* ('On the Fabric of the Human Body'). He advocated the need for dissection and was able to prove that some long held beliefs about the body going back to the time of Galen were wrong.

Another graduate of Padua University in Italy, William Harvey, made another anatomical breakthrough almost a century later by accurately describing the circulation of blood around the body by the heart. This disproved once and for all another aspect of Galenic medicine. Then, in 1761, another professor at Padua, Italian physician Giovanni Battista Morgagni, published *De sedibus et causis morborum per anatomen indagatis* ('The Seats and Causes of Diseases Investigated by Anatomy') containing more than 60 years of work on the causes of disease. By conducting post mortem examinations, he developed the science of pathological anatomy.

In the 17th century, scientific and medical men began to investigate the unseen world by using the new invention of the microscope. The English polymath Robert Hooke published images of what he saw under the microscope, coining the word "cell" to describe the structure of cork. The Dutchman Antoine van Leeuwenhoek had used magnifying glasses to inspect the quality of fabrics he bought and sold, and then developed a new kind of microscope, seeing little wiggling "animalcules" (bacteria) and spermatozoa for the first time.

In the field of surgery, the French battlefield barber surgeon Ambroise Paré made innovations in treating wounds and invented instruments in the 16th century, earning him the nickname, 'the father of modern surgery'. He was a modest man who often claimed that "I bandaged him and God healed him".

## CURING THE PLAGUE

For all the advancements, though, the early modern period continued to experience devastating mortality from the plague. From 1665 to 1666, the Great Plague ravaged London, killing an estimated 100,000 people, and the medical world was largely powerless to help.

The miasma theory led people to carry bottles of perfume, burn sweet scented herbs in one's home, or light fires in the streets to purify the air. Continued belief in humoural theory meant that bloodletting was still being regularly prescribed to restore the balance of the fluids in the body. Other ways to ward off plague were to carry lucky charms, such as a hare's foot, or rubbing the plague sores with a live chicken. Houses were fumigated or, if those inside were already ill, closed off and marked with a cross.

As cities experiences waves of plague, they instituted increasingly effective quarantine measures, and not just for people. It was understood that clothing and fabric might also be a vector for the disease, so trading was also regulated to help diminish the risk of transmission.

Eventually such measures succeeded; the last epidemic of plague in Western Europe occurred in Marseille in 1720–21. Thousands died, but the epidemic did not spread to the rest of Europe; it was limited to the city and its environs. And it was the last European plague; quarantine worked.

While miasma, or bad air, continued to be blamed for outbreaks of plague, the nature of contagious diseases began to be explored. Syphilis arrived in Europe in 1495, in the midst of the siege of Naples, and it was immediately recognised as a brand-new disease. There was no point looking to Hippocrates or Galen; new medical knowledge had to be made. It was quickly recognised that the disease was sexually transmitted, although often women were blamed far more than men for its spread. New drugs like mercury and the New-World guaiac wood quickly became the remedies of choice for this new ailment.

Physicians may have failed to tackle the Great Plague effectively, but they did develop a greater understanding of contagions. "People began to see the way plague spread and reacted with quarantining measures," Fissell explains. "The advent of the French pox, what we call syphilis, was also understood as a sexually transmitted disease early on. In the early modern period, we begin to see more articulated ideas and practices, such as increasing development of quarantines or locking people in their house when they have the plague to prevent contagion."

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# HEALTHCARE IN 18TH-CENTURY BRITAIN

## Surgery and care for the poor improved, while pioneering preventative treatments helped combat a killer disease

**WORDS: EMMA SLATTERY WILLIAMS**

By the late 18th century, Britain was seeing the beginnings of the Industrial Revolution, a process that eventually led to a huge migration of people to industrial cities, with widespread overcrowding and unsanitary living conditions. Drinking water was often contaminated with raw sewage, rubbish rotted in the streets, and crowded living conditions meant disease could easily spread. As many as one in five children died before their second birthday.

There was, however, growing institutional provision for curing the sick and the number of hospitals grew in 18th-century Britain – some of these were run by local parishes, while others were founded by philanthropists wishing to help the poor and perhaps improve their own social position in the process. In return for an annual contribution, a benefactor could recommend a sick person for admission to hospital. Fissell explains: "The notion was that you could intervene and save working class people who might otherwise die for lack of healthcare. It was part of a larger, almost mercantilist, view of the health of the population being a significant variable for government."

**"We see a growth in the institutional provision of healthcare that simply hadn't been seen before"**

The 18th century also saw improvements in surgery. Surgeons such as William Cheselden, Percival Pott, and John Hunter delved into anatomical studies, diagnosing new diseases, and inventing new procedures. In 1745, the Company of Barber Surgeons was divided into two separate bodies by an act of Parliament. Thus, the Company of Surgeons was born, a body that formalised the training and licensing of surgeons and which today is known as the Royal College of Surgeons.

Dispensaries also began to be established – these provided what we might today class as outpatient medical treatment and advice, solely for the poor and free of charge. By 1800, about 40 dispensaries had been founded across Britain. Fissell explains: "In 18th-century Britain, we see a growth in the institutional provision of healthcare that simply hadn't been seen before. For the first time, working people who could never have afforded healthcare previously

LEFT: **In 1752, an act was passed in Britain allowing the bodies of murderers to be used for dissection, as shown in this engraving by William Hogarth**

ABOVE: **A recreation of an 18th-century pharmacy**

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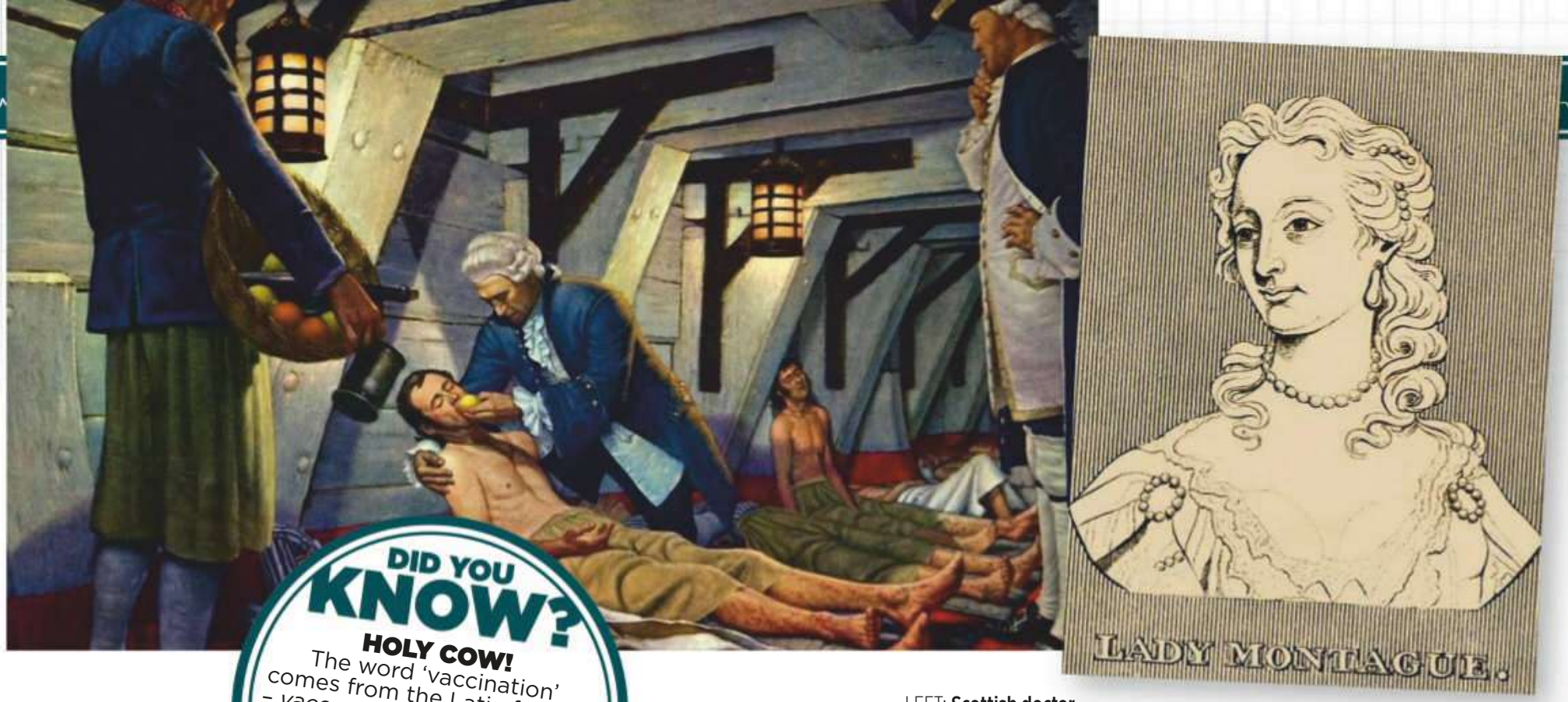



**DID YOU KNOW?**

**HOLY COW!**

The word 'vaccination' comes from the Latin for cow – *vacca* – in honour of Edward Jenner and his method of using cowpox to make his world-changing discovery to prevent people catching smallpox.

could now access it in a new way. We can also see something similar in the workhouse infirmaries of the Old Poor Law at this time."

It is this preventative rather than reactive approach to healthcare that remains a legacy of 18th century medicine, Fissell continues. "I see this as part of an enlightened turn towards the belief that things could be made better. It was a realisation that it was possible to prevent people from dying of disease and illness, and that's really radical."

One of the deadly diseases that was rife in the early 18th century was smallpox, characterised by its distinctive, progressive skin rash; outbreaks killed millions of people all over the globe. In 1715, Lady Mary Wortley Montagu one of the most celebrated aristocratic women of the time caught smallpox but survived, although the disease left her scarred. Her brother William had died from the disease in 1713, aged just 20.

The following year, Lady Mary and her husband, Britain's new ambassador to the Ottoman Empire, moved to Constantinople. There, Lady Mary discovered the widespread use of variolation (inoculation) individuals were deliberately infected with smallpox (often by blowing dried smallpox scabs into the nose) after which they contracted a mild form of the disease. After recovering, the individual would usually be immune to smallpox – some estimates state that 1 2 per cent of those inoculated died, compared to 30 per cent who died after contracting the disease naturally.

LEFT: **Scottish doctor James Lind cured scurvy in his crew with citrus fruits in the 1740s; it would be decades before the Admiralty prescribed lemon juice to sailors**

RIGHT: **As well as introducing inoculation to Britain, Lady Mary Wortley Montagu was also an acclaimed writer and poet**

Lady Mary's children were inoculated and once back in England, in 1721, she publicised the benefits, facing resistance and scepticism. Undaunted, Lady Mary convinced Caroline, then Princess of Wales, of the value of inoculation and it was tested on prisoners, all of whom survived. Physicians began to inoculate their patients, but devised elaborate and costly procedures to make sure the body was prepared, ensuring that only the well to do were protected. By the late 18th century, mass inoculations with no preparation were on offer, and ultimately Lady Mary's efforts paved the way for the work of Edward Jenner (*see box below*).

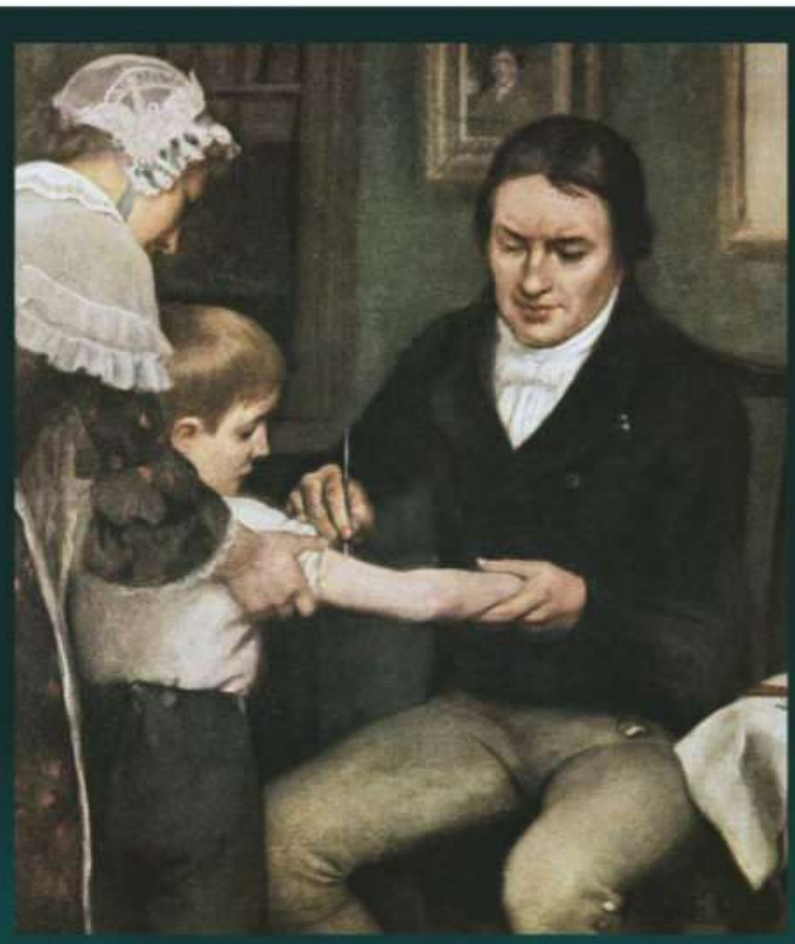
## EDWARD JENNER AND VACCINATION

### Jenner used local knowledge to develop a life-saving protection against smallpox

As a child, Edward Jenner (1749-1823) was inoculated against smallpox – thanks to the work of Lady Mary Wortley Montagu (*see above*) and at 14 was apprenticed as a surgeon. In 1770, Jenner moved to London to train under renowned surgeon John Hunter before returning home to Gloucestershire and becoming a local practitioner.

Growing up in the country, Jenner was aware of an old wives' tale that said people who caught cowpox – a mild infection caught from cows – never caught smallpox. Inoculation, which Jenner carried out on his patients, still posed a risk, so he began to research alternatives. In 1796, Jenner inoculated eight-year-old James Phipps with pus from a cowpox sore; a few weeks later, he infected him with matter from smallpox pustules, but Phipps never went on to develop the disease. The following year, Jenner submitted his findings to the Royal Society but his ideas were rejected as too radical. After experimenting on other children, including his own infant son, Jenner published his findings in 1798.

Although Jenner's methods were initially ridiculed and even criticised, and his initial tests would be considered unethical today, it soon became hard for anyone to deny the obvious protection vaccination offered. Nearly 200 years later, in 1980, smallpox was declared officially eradicated by the World Health Organization.



Dr Edward Jenner shown performing his first vaccination against smallpox on eight-year-old James Phipps

# VICTORIAN MEDICINE

## The 19th century paved the way for many of the modern medical practices that continue to benefit us today

**WORDS: CHARLOTTE HODGMAN**

The 19th century was a period of rapid technological change, and huge shifts in scientific understanding. As medical knowledge increased, the prospect of surgery was no longer a likely death sentence, and great leaps were made in medical procedures, equipment and knowledge of how the body worked.

By the 1860s what would become known as cell theory was widely accepted: that all living organisms are composed of one or more cells; that the cell is the basic unit of structure and organisation in organisms and that cells are created from pre-existing cells. New methods in cell staining and the development of technology, such as the microscope, also played crucial roles in furthering biological breakthroughs and aiding new research.

One of the most important medical breakthroughs of the 19th century was French chemist Louis Pasteur's discovery that germs cause disease, following on from Italian bacteriologist Agostino Bassi's work on silkworm infections. Pasteur's work with pasteurisation and his subsequent breakthroughs with inoculations against anthrax and rabies in turn inspired men like Robert Koch, who, in the early 1880s, identified the microorganisms that cause tuberculosis and cholera and created standards for researching the links between germs and disease.

"Having the ability to separate different bacteria and identify them for the first time was a huge medical breakthrough," says Professor Mary Fissell. "Being able to associate a specific germ with a specific disease and form a clear relationship between the two ushered in a completely new way of thinking about the body and ill health. There wasn't an immediate therapeutic payoff to the discovery, but it wasn't long before scientists started to figure out that antitoxins could be created to cure specific diseases.

"The first antitoxin, for diphtheria, was developed in the early 1890s and its impact was incredibly dramatic. I've always loved the fact that, in Britain, the diphtheria antitoxin was held in police stations because they could be accessed all night."

## 9 MEDICAL BREAKTHROUGHS

From X-rays to new wonder drugs, the 19th century saw seismic change

### STETHOSCOPE

In 1816, French physician René Laënnec observed two children signalling to each other via a piece of wood and a pin – one child had their ear to the wood and was receiving the amplified sound of a pin being scratched at the opposite end. Laënnec was inspired by this acoustic phenomenon to invent the stethoscope, with which the sounds made by the heart and lungs could be heard more clearly.

### QUININE

In 1820, French scientists Pierre Pelletier and Joseph-Bienaimé Caventou discovered the process to extract and isolate quinine from the bark of the Cinchona tree, which had been used in powdered form to treat malaria since the 17th century.

### ASPIRIN

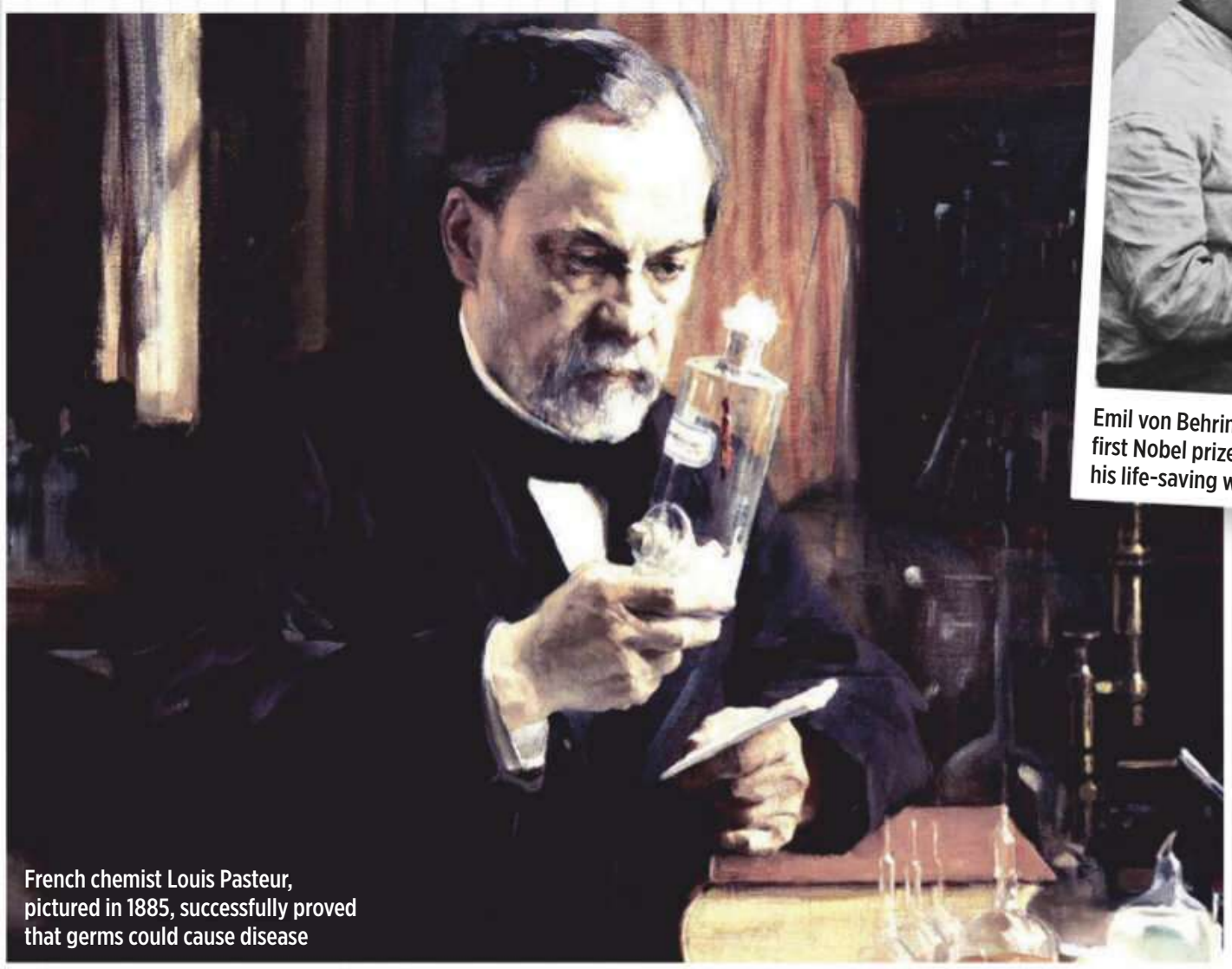
In 1897, German chemist Felix Hoffman successfully combined acetylating salicylic acid with acetic anhydride, creating acetylsalicylic acid, a substance that could relieve fever, pain, and inflammation without upsetting a patient's stomach.

### CHLOROFORM

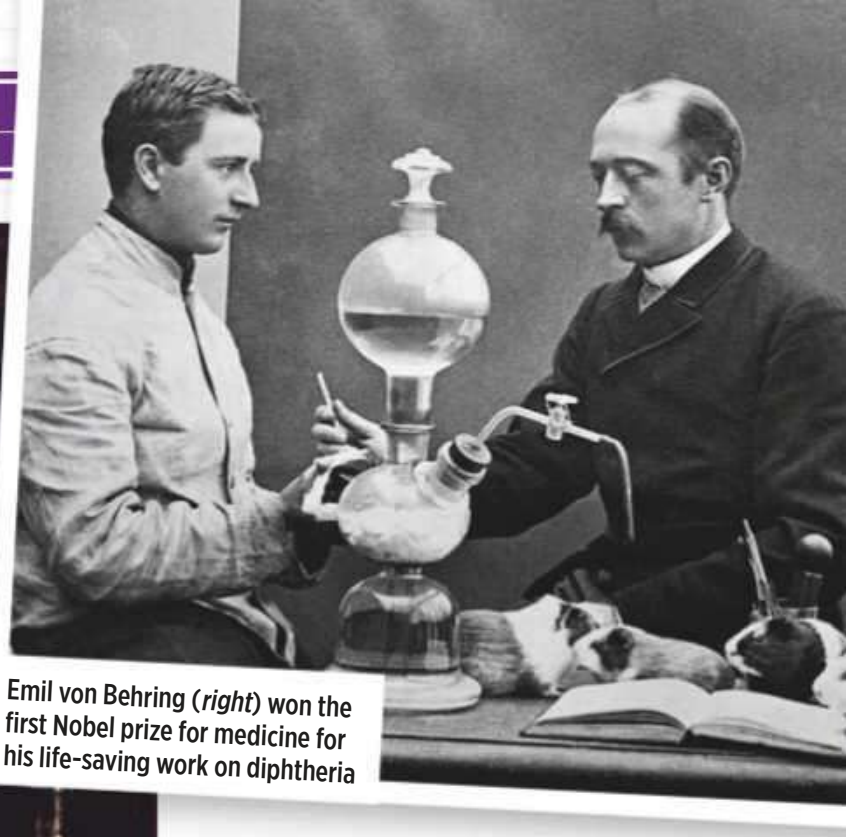
In 1847, James Young Simpson, professor of midwifery at the University of Edinburgh (*below*), became the first physician to demonstrate the anaesthetic properties of chloroform on humans. He went on to pioneer its application in surgery and obstetrics.

### ANTISEPTIC

Using the work of men like Louis Pasteur and Ignaz Semmelweis (the latter who proved that doctors were responsible for transmitting childbed fevers in hospitals), Joseph Lister developed a carbolic acid spray for use during surgery. The death rate from infection after surgery decreased significantly as a result, although it was later realised that carbolic acid damaged tissues in the body.



French chemist Louis Pasteur, pictured in 1885, successfully proved that germs could cause disease



Emil von Behring (*right*) won the first Nobel prize for medicine for his life-saving work on diphtheria

## INTERNAL OPERATIONS

Prior to the 19th century, surgery had largely been performed outside the body – the only real operative surgery undertaken was the removal of bladder stones, a procedure performed without anaesthetic and usually completed in under two minutes to avoid the patient dying of shock and pain. In 1658, prolific diarist Samuel Pepys had a bladder stone allegedly the size of a tennis ball removed without pain relief – historians have suggested Pepys may have survived the procedure because he had been first on the surgeon's list that morning and had therefore been operated on with clean tools and hands!

"The advent of anaesthesia and antiseptic surgery was a real game changer, and surgery as we know it today was really invented in the late 19th century", comments Fissell. "As germ theory developed, people began to conceptualise what that might mean in terms of surgery. Initially, antiseptic surgery saw mists of carbolic acid continually sprayed in operating rooms during medical procedures in order to kill bacteria in the air, and wounds were packed and covered with lint and gauze soaked in carbolic acid. But by the 1880s, aseptic practices were being developed, eventually including steam sterilisation of instruments, rubber gloves, and the wearing of surgical gowns."

**"Police stations held the diphtheria antitoxin because they could be accessed all night"**

Continues on p52

### X-RAYS

In 1895, German physicist Wilhelm Röntgen accidentally discovered X-rays while testing whether cathode rays could pass through glass. Soon, doctors in Europe and the US were using X-rays to locate gun shots, bone fractures, swallowed items and kidney stones.

### ELECTRIC HEARING AID

The first portable electric hearing aid was patented in 1895 by electrical engineer Miller Reese Hutchison (*below*). Known as the Akouphone, it used a carbon transmitter and electrical current to amplify weak audio signals.

### HEART SURGERY

In 1893, African-American general surgeon Daniel Hale Williams (*above*) performed the first successful documented heart surgery on a young black man, James Cornish, who had been stabbed in his chest. Cornish survived and was discharged 51 days later.

### OPHTHALMOSCOPE

The German physiologist Hermann von Helmholtz is generally considered to have invented the ophthalmoscope, in 1851, although English mathematician and inventor Charles Babbage is also a contender. The device revolutionised ophthalmology, allowing physicians to examine the inside of the human eye.

GETTY IMAGES X11

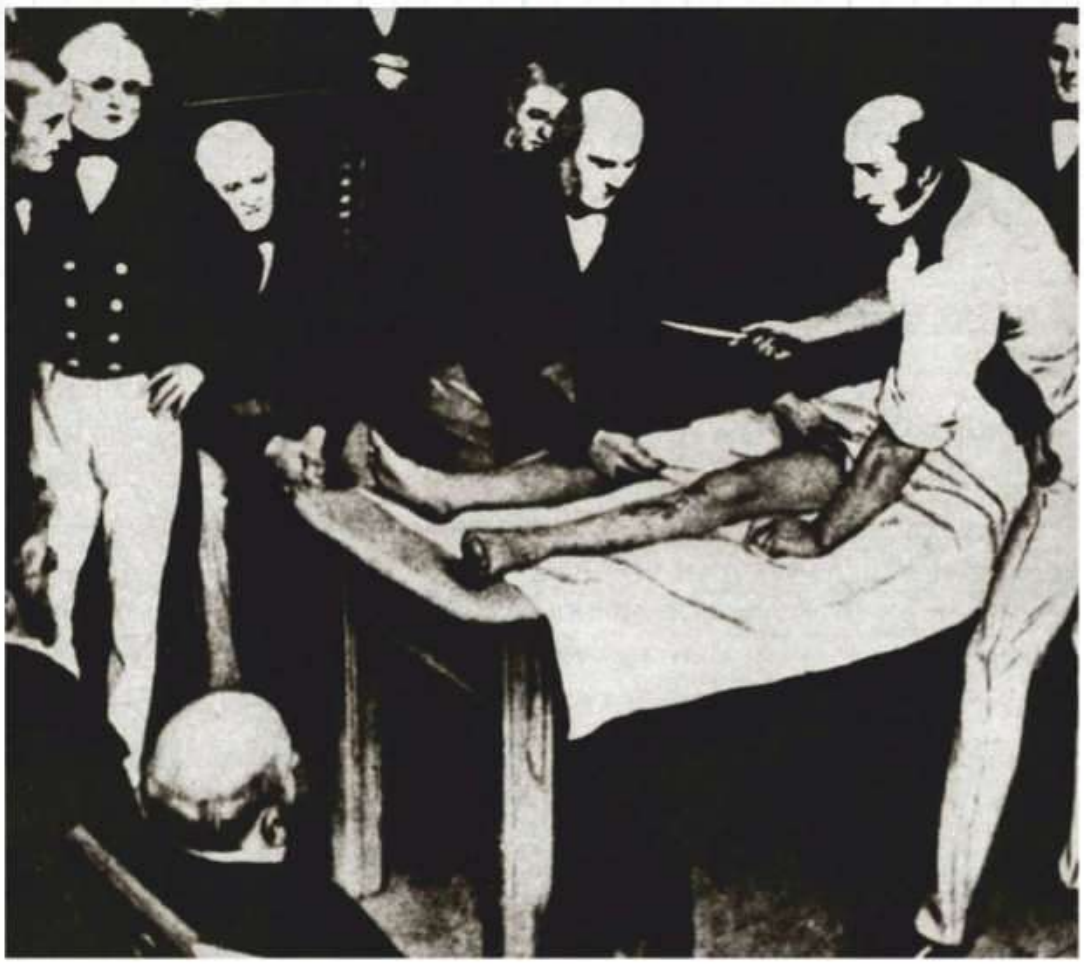
# THE GREATEST SHOWMAN?

## Scottish surgeon Robert Liston was always keen to demonstrate his knife skills

In the early 19th century, surgeons became minor celebrities as they vied with each other to operate on conscious patients – before anaesthesia – in the quickest time.

One of era's most famous surgeon-showmen was Scotsman Robert Liston whose speed at amputation (just 30 seconds in some cases) was widely celebrated. On one occasion, Liston's enthusiasm saw him amputate a patient's testicles as well as their leg, while on another occasion, his knife accidentally amputated his assistant's fingers in addition to his patient's limb – both the assistant and the patient later died of infection.

Nevertheless, Liston, who, unusually for pre-germ theory times, always removed his frock coat before operating, performed 66 amputations between 1835 and 1840, of which 'only' 10 died (1 in 6 patients). Elsewhere, at nearby St Bartholomew's Hospital, one in four patients ended up in the mortuary.



Surgeon Robert Liston (*right*) was renowned for his remarkable speed at the operating table

# A POOR STATE OF HEALTH

## Britain's filthy and overcrowded cities caused cholera chaos

Between 1801 and 1841, Britain witnessed a population explosion: the number of people living in London doubled, and in Leeds, the number nearly tripled. Many cities' housing and sanitation systems struggled to cope, and people were forced to live in appalling conditions: disease was rife.

Cholera – a bacterial infection caused by contaminated food or water – first arrived in Britain in 1831 and thrived in crowded, industrial towns. A cholera epidemic in 1831–32 claimed more than 50,000 lives across Britain, followed by another in 1848-9 – during which a Board of Health was set up, with the power to clean streets and build sewers. But with the prevailing theory in the first half of the 19th century being that disease was spread via bad air, more than 20,000 people died in a cholera outbreak in 1854.

It was during this third epidemic that Dr John Snow made the connection between contaminated water and cholera – he plotted cases in the Soho area of London and identified a specific water pump as a source of contagion. After the pump handle was removed, cholera cases dropped dramatically. Mass vaccination programmes also launched in the 19th century – in 1853, smallpox vaccination became mandatory in the first three months of an infant's life. And in 1875, a Public Health Act placed responsibility for public health on local councils – streets, sewers and water supplies were to be kept clean and inspectors hired to enforce the laws.



MAIN: **Many city-dwellers lived in cramped, unhygienic conditions, as this 1872 illustration of London's Seven Dials district shows**

INSET: **A wooden chest containing cholera medication, alongside a photograph of Dr John Snow – famous for connecting the spread of the disease to contaminated water**

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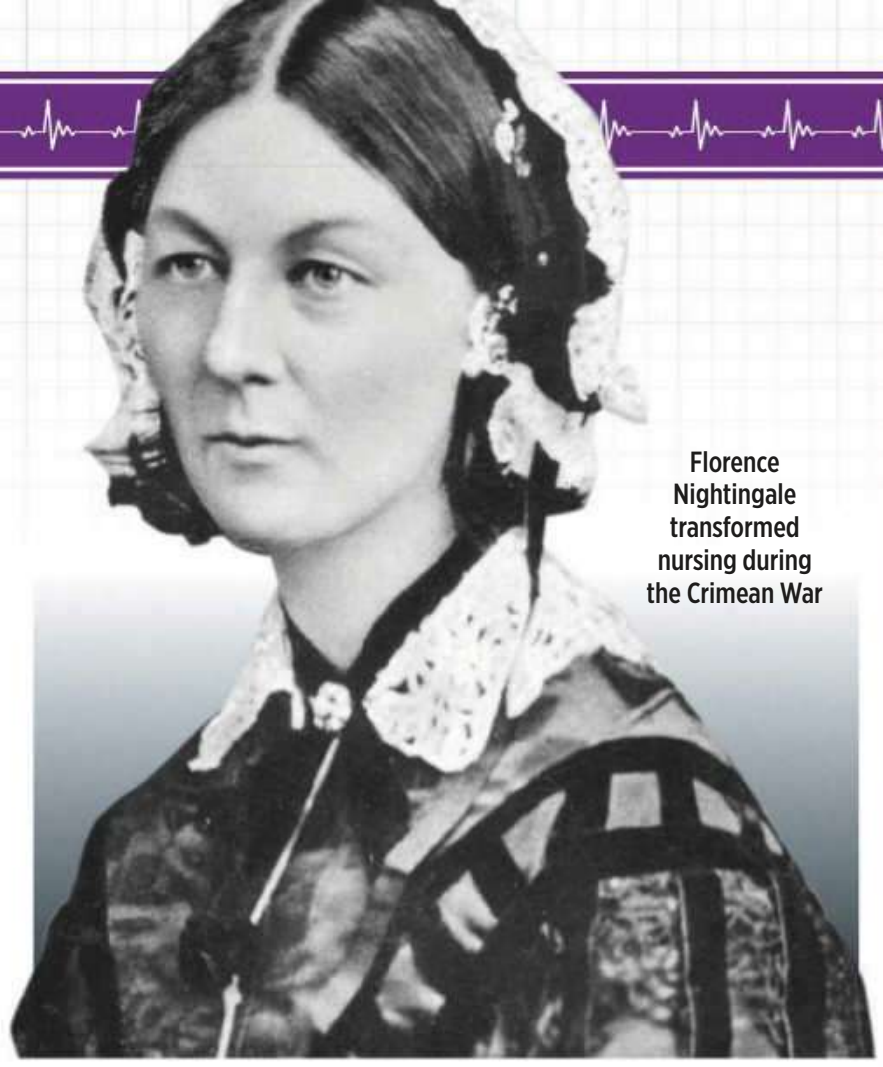

Florence Nightingale transformed nursing during the Crimean War

# TRUE TRAILBLAZERS

## Florence Nightingale and Elizabeth Garrett Anderson both made marks in a man's world

The foundations of modern nursing and the nursing profession itself were laid in the 19th century, and both owe a great deal to individuals such as Florence Nightingale (*above*), whose experiences as a nurse during the Crimean War revolutionised nursing practices. Arriving in Scutari, the British base hospital near Constantinople in November 1854, Nightingale and her team of nurses were greeted by horrific conditions: rodents and bugs; patients lying in their own excrement; contaminated water and lack of basic medical supplies.

Prioritising cleanliness and fresh air, Nightingale's tireless work saw the death rate in Scutari fall from 43 per cent to 2 per cent and the establishment of a Royal Commission for the Health of the Army, in 1857. News of her work spread and by 1900 there were 64,000 trained British nurses, with Nightingale herself founding a Training School for Nurses in 1860. In 1876, women were permitted to enter the medical profession with Elizabeth Garrett Anderson (*below*) becoming the first Englishwoman to qualify as a doctor.

Dr Garrett Anderson later became a leading figure in the suffrage movement

**DID YOU KNOW?**

**A DUTY OF CARE**

Another notable figure of the Crimean War was Jamaica-born Mary Seacole, who used her own money to establish the British Hotel – a place of respite for sick and recovering soldiers – near Balaclava. Her work and compassion saw her dubbed "Mother Seacole".

# BIG NUMBERS

## Vital statistics from the world of Victorian medicine

**8**

In 1853, Queen Victoria was anaesthetised with chloroform for the birth of her eighth child

**22,698**

The number of physicians and surgeons in England and Wales in 1901 (including 212 women)

**140**

The number of female dentists in England and Wales in 1901, out of a total of 5,309

**52**

The average age of a wealthy person living in the countryside in 1842

**15**

The average age of death for a labourer living in Liverpool in 1842

**7.6**

The number of inhabitants per house in Scotland in 1861. The introduction of 50 new statutes on housing saw the number drop to 4.7 by 1901

**30**

The length of time, in seconds, it reportedly took Scottish surgeon Robert Liston to amputate a leg

# 10 GIANT LEAPS IN 20TH-CENTURY MEDICINE

The 20th century arguably witnessed more seismic medical breakthroughs than any other period of history. A deeper understanding of science allied to a growing number of technological advances helped to eradicate certain diseases, and limit the spread of others, resulting in vastly improved life expectancy across the world compared to a hundred years earlier. **WORDS: NIGE TASSELL**

## 1 KARL LANDSTEINER IDENTIFIES DIFFERENT BLOOD GROUPS

Dr Karl Landsteiner, pictured hard at work at his microscope in 1930

At the turn of the century, the Austrian biologist Karl Landsteiner identified the existence of three different blood groups within humans, A, B and O (although he called the latter C). This fuelled his subsequent discovery that combining blood from different groups resulted in blood cells being destroyed, while transfusing the blood of two people of the same blood group did not. With his sound science underpinning it, the practice of blood transfusions was established, leading to millions of lives being saved in the 120 years since Landsteiner's discovery. For his breakthrough work, he was awarded the Nobel Prize in Physiology or Medicine in 1930.

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## 2 FLOREY AND CHAIN DEVELOP PENICILLIN INTO A USABLE DRUG

A bottle of penicillin culture from c1943. The wonder-mold has saved hundreds of millions of lives

Alexander Fleming is rightfully celebrated for his discovery of penicillin in his laboratory in St Mary's Hospital, London, in 1928. But it was two other scientists – an Australian pathologist and a German-born biochemist – who carried out the first clinical trials of penicillin 13 years later, before successfully creating a usable antibiotic drug out of Fleming's pioneering work. Howard Florey and Ernst Chain's collaborative breakthrough was a major boon to world health and is believed to have saved in excess of 200 million lives. Florey later admitted that creating a medicine was a fortuitous by-product: "I don't think it ever crossed our minds about suffering humanity. This was an interesting scientific exercise."

## 3 CRICK AND WATSON DISCOVER THE MOLECULAR STRUCTURE OF DNA

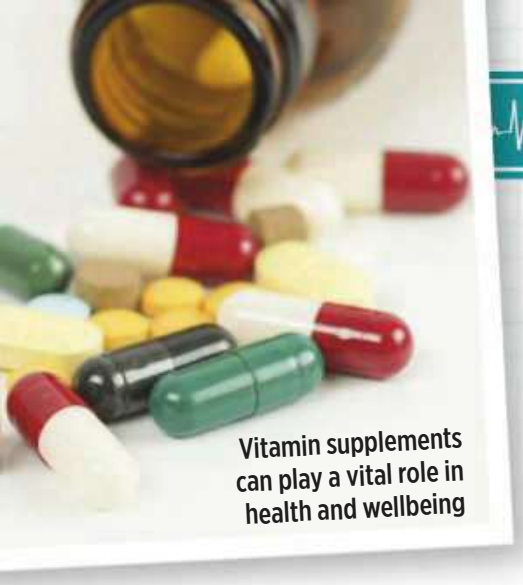
Francis Crick and James Watson formed one of the 20th century's most notable scientific partnerships. In 1951, the two biophysicists – one English, one American – joined forces at the Cavendish Laboratory at the University of Cambridge and, over the next couple of years, they discovered the structure of DNA; how it carries genetic codes in order to replicate itself. They built on the work of two London-based scientists – Maurice Wilkins and Rosalind Franklin – and, in 1962, Crick, Watson and Wilkins shared the Nobel Prize in Medicine for this breakthrough, which revolutionised molecular biology. Franklin, who had died in 1958 at the age of 37, couldn't be awarded the prize posthumously.

Rosalind Franklin was never recognised in her lifetime for her critical work with DNA

## 4 THE FIRST USE OF CHEMOTHERAPY IN TREATING CANCER

Goodman and Gilman's nitrogen mustard compound being injected

In the early 1940s, two doctors based at Yale University, Louis S Goodman and Alfred Gilman, were assigned to the US Army to study the effects of nitrogen mustard – a derivative of mustard gas, the chemical weapon used extensively during World War I. Studying 25-year-old medical records, the pair observed that many casualties exposed to mustard gas had a low count of white blood cells and speculated that if mustard gas could kill off white blood cells, it could do the same to cancerous ones. In 1942, they treated a 48-year-old gravely ill cancer patient with nitrogen mustard, euphemistically calling it a "synthetic lymphocidal chemical". After a number of treatments, the patient's condition noticeably improved. The experiment was the foundation stone of chemotherapy.



Vitamin supplements can play a vital role in health and wellbeing

## 5 THE IMPORTANCE OF VITAMINS IS RECOGNISED

There is no 'eureka!' moment in the history of vitamins. No one breakthrough dominates this field of study as the emergence of their importance has been a slow trail of smaller discoveries by a wide cast of eminent scientists, among them Umetaro Suzuki, Sir Frederick Gowland Hopkins, Christiaan Eijkman and Casimir Funk. Among the significant milestones on this drawn-out journey was the realisation that certain diseases – such as rickets, pellagra and scurvy – weren't caused by infections, but a deficiency in particular vitamins. This led, from around 1910 onwards, to chemists identifying vitamins, calculating their chemical make-up, and developing ways to create and manufacture synthetic vitamin supplements. This in turn led to a reduction, and even eradication, of diseases during the 20th century and beyond.

Samples of insulin from shortly after the Nobel prize-winning discovery

## 6 INSULIN DEVELOPED TO TREAT DIABETES

On 11 January 1922, a team of scientists – Canadian physician Frederick Banting, his biochemist compatriot James Collip and an American-Canadian lab assistant Charles Best, under the directorship of Scottish biochemist John Macleod – administered the first-ever injection of insulin. Insulin is a hormone produced by the pancreas that regulates the level of glucose in the blood. As many diabetics are unable to produce insulin in necessary amounts (if at all), there was a need for artificially administered doses to balance blood sugar levels. That first injection, given to a gravely sick 14-year-old boy called Leonard Thompson, caused an allergic reaction due to the impurity of the dose, but a second nearly a fortnight later removed the excess glucose from the teenager's blood.

## 7 THE AVAILABILITY OF THE PILL

A tablet so ubiquitous and revolutionary that it's still known simply as 'the Pill', this oral contraceptive has allowed millions of women to separate sexuality and childbearing. US activist Margaret Sanger was the Pill's driving force. As the founder of the American Birth Control League, her lobbying helped fund the work of endocrinologist Gregory Pincus, with the US Food and Drug Administration approving it in 1960. The following year, the UK's Minister for Health, Enoch Powell, announced that the Pill could be prescribed on the NHS, but initially only to married women. It wasn't until 1974 that it was made available to all women.

The Pill was a milestone moment in the fight for women's reproductive rights

## 8 THE EMERGENCE OF LIFE-SAVING VACCINES

The race to produce effective vaccines to protect people against Covid-19 has been only the latest attempt to immunise before illness strikes. While Edward Jenner is largely regarded as the person who conceptualised the idea of vaccination with his smallpox vaccine in 1796, it was during the 20th century that the development of worldwide vaccination truly kicked in. Some of the most notable ailments for which vaccines were found include tuberculosis (a vaccine for which was first administered in 1921), diphtheria (1923), yellow fever (1938), polio (1950s) and the combined measles/mumps/rubella (1971).

Tens of thousands of polio vaccines are boxed up at Eli Lilly and Company plant

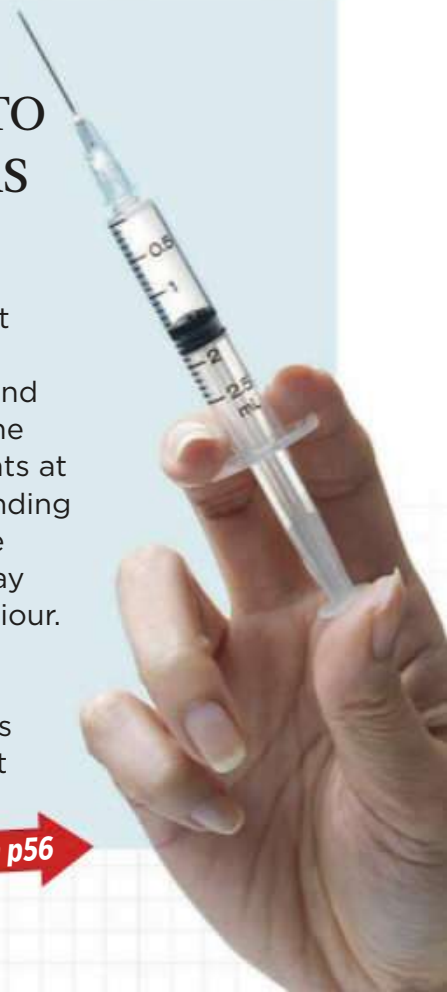
## 9 THE PIONEERING USE OF X-RAYS

An early form of X-ray machine was the fluoroscope, but was highly dangerous

X-radiation was discovered in 1895 by German scientist Wilhelm Röntgen who recognised its potential application in diagnosing fractures. But its widespread use in medicine was comparatively limited until the modern hospital, with a dedicated radiology department, revolutionised healthcare. Not that this stopped some enterprising individuals making good use of the technology. Among these was Polish-born French physicist Marie Curie, who invented a 'radiological car', which in 1914 she took to the battlefields of World War I. The vehicle carried an X-ray machine and photographic darkroom equipment, allowing army surgeons to make diagnoses of wounded troops.

## 10 THE INVENTION OF CHLORPROMAZINE TO EASE PSYCHOTIC DISORDERS

Until the drug chlorpromazine came into widespread use in the mid-20th century, psychotic disorders were treated somewhat more invasively by the medical profession, including the use of electroshock therapy and surgical procedures, including lobotomy. The drug's first clinical trial, on psychotic patients at a Parisian hospital in 1952, produced astounding results, with the effects going beyond mere sedation and allowing the patients to display lucid, rational thought and improved behaviour. Very quickly, chlorpromazine injections became the standard treatment for schizophrenia and other manic disorders, as well as paving the way for the development of milder antidepressants.



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# WAR WOUNDS

World War I brought about devastating numbers of life-altering injuries, as new weapons caused complex wounds that required new kinds of surgical techniques. From time-critical surgery performed on the frontline to new methods of facial reconstruction and treating the psychological scars of conflict, medical innovations emerged from the devastation of war

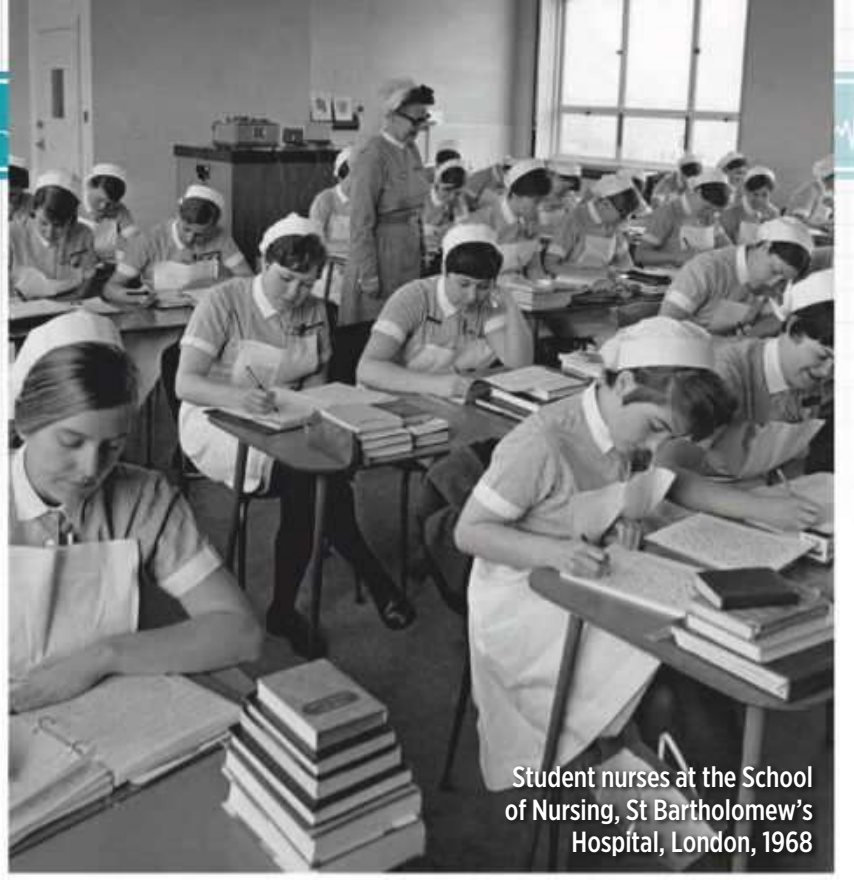
**▲ HIDDEN INJURIES**
Between 1914–18, the British Army dealt with 80,000 cases of shell shock. Symptoms varied hugely: some suffered mutism and paralysis or went blind or deaf, others developed stutters and tics or experienced nightmares, depression and anxiety. As doctors sought to understand what caused shell shock, a variety of treatments emerged, including hypnotism, occupational and talking therapies, and even electrotherapy.

**▼ CRUCIAL TECHNOLOGY**
Despite only being discovered in 1895, X-rays – known as Röntgen rays after the man who discovered them – were already being deployed in medicine by World War I and proved invaluable in war surgery. Here, German medical technicians use Röntgen apparatus in c1916.

**▼ MEASURING UP**
An estimated 240,000 British soldiers suffered total or partial amputations during World War I, so there was a real need for workshops like this one – probably associated with Queen Mary's Convalescent Auxiliary Hospital, London – which made and fitted artificial limbs for injured British soldiers.

**◀ PIONEERING TECHNIQUES**
In 1917, New Zealand-born surgeon Harold Gillies developed new methods of facial reconstructive surgery in response to the terrible injuries caused by new weapons of war. Masks were often an option for patients (*left*), but Gillies pioneered new ways – such as the tubed pedicle – to ensure skin grafts were accepted over the site of injury, laying the foundations of plastic surgery.

**▶ HELPING HANDS**
This young man is demonstrating, in July 1918, the American Red Cross's Adjustable Abduction Arm Splint. It was designed to be used for arm fractures and could be placed on either arm and adjusted to any position.



Student nurses at the School of Nursing, St Bartholomew's Hospital, London, 1968

# THE NHS

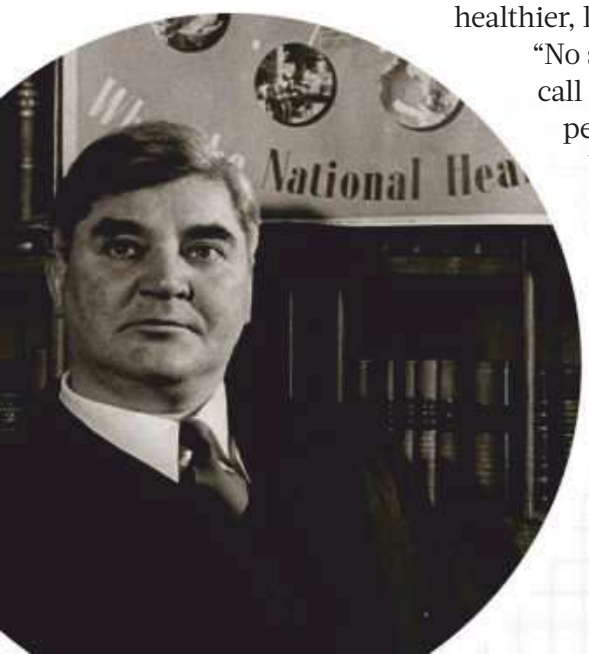
## One of the first completely free healthcare systems revolutionised public health

In 1942, the Beveridge Report recommended the initiation of "comprehensive health and rehabilitation services for prevention and cure of disease", a proposal that garnered cross-party support in the House of Commons. When the Labour Party won the 1945 General Election, one man was charged with drawing up and driving this new programme of health provision: the newly appointed Minister for Health, Aneurin Bevan.

Founded on the principles that healthcare should be universal and comprehensive, and not based on a patient's ability to pay, the National Health Service was launched in 1948, the cost of which was covered through taxation and National Insurance contributions (although the principled Bevan quit the role and his party when modest charges for glasses and dentures were introduced three years later). Since then, and despite near-constant discussion and crises about its funding, the NHS remains one of the cornerstones of British society – and was justly celebrated as part of the opening ceremony of the 2012 Olympic Games in London.

The service has grown hugely since Bevan's day. In 1948, the service employed approximately 11,700 doctors and 68,000 nurses. Seventy years later, in 2018, NHS nurses numbered 217,000, while doctor numbers had increased ten-fold. In 1948, though, the NHS boasted 480,000 hospital beds; by 2018, this figure was down to just around a third of that. But this isn't solely down to insufficient funding. The UK population in the 21st century is generally a much healthier one than in the years following World War II. And the NHS is hugely responsible for this, those principles of comprehensive and universal care helping to ensure that, as a nation, we live healthier, longer lives.

"No society can legitimately call itself civilised if a sick person is denied medical aid because of lack of means," Bevan once declared. And despite the heavyweight pressures caused by the Covid-19 pandemic, this doctrine remains the fundamental reason for the NHS's existence.



Health Minster Aneurin Bevan championed free healthcare for all

# GET HOOKED

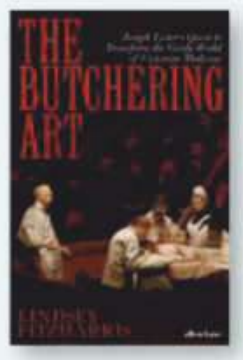
If we've whetted your appetite for all things medical, why not explore the topic further with our pick of books, films and podcasts

## BOOKS

**Vernacular Bodies: The Politics of Reproduction in Early Modern England**

**By Prof Mary Fissell (OUP, 2004)**

Mary Fissell employs a wealth of popular sources – ballads, jokes, witchcraft pamphlets, prayerbooks, popular medical manuals – to produce the first account of women's reproductive bodies in early-modern cheap print, and explore the mysteries of early modern reproduction.




**The Butchering Art: Joseph Lister's Quest to Transform the Grisly World of Victorian Medicine**

**By Lindsey Fitzharris (Allen Lane, 2017)**

Historian Lindsey Fitzharris tells the story of how one of Britain's greatest medical minds finally brought centuries of savagery, sawing and gangrene to an end, and also finally managed to solve the 'riddle' of post-operative death.

**The Invention of Medicine: From Homer to Hippocrates**

**By Robin Lane Fox (Allen Lane, 2020)**

Robin Lane Fox puts the invention of medicine in a wider context – from the epic poems of Homer to the first doctors known to have been active in the Greek world – and examines what we *actually* know about Hippocrates and his Oath, and the many writings that survive under his name.

## ONLINE AND AUDIO

▶ **The Making of Modern Medicine** *(BBC Radio 4):* A 30-part series exploring the history of medicine. Listen at *bbc.co.uk/programmes/b00k9b7r*

History Extra

▶ **For podcasts, features, quizzes, interviews and more on the history of medicine, visit our website: *historyextra.com/topic/medicine-and-health***

## WATCH

**Pain, Pus and Poison: The Search for Modern Medicines**

**(BBC Four, now available on BBC iPlayer)**

Dr Michael Mosley reveals the hidden stories behind some of our most useful and valuable drugs, as well as early attempts to tackle infection and manage pain.

**Radioactive**

**(Film, 2019)**

A feature-length drama that documents the life of scientist Marie Curie – from meeting her future husband, Pierre, to her death at the age of 66, showcasing her world-changing discoveries and their effects.

GETTY IMAGES X5, ALAMY X3, BBC X1

MAIN: **An inflatable M4 Sherman tank positioned in woodland – one of many tools at the Ghost Army's disposal**

INSET: **Bernard Bluestein, who served with the Ghost Army as a member of the 603rd Engineer Camouflage Battalion**

# MASTERS OF DISGUISE

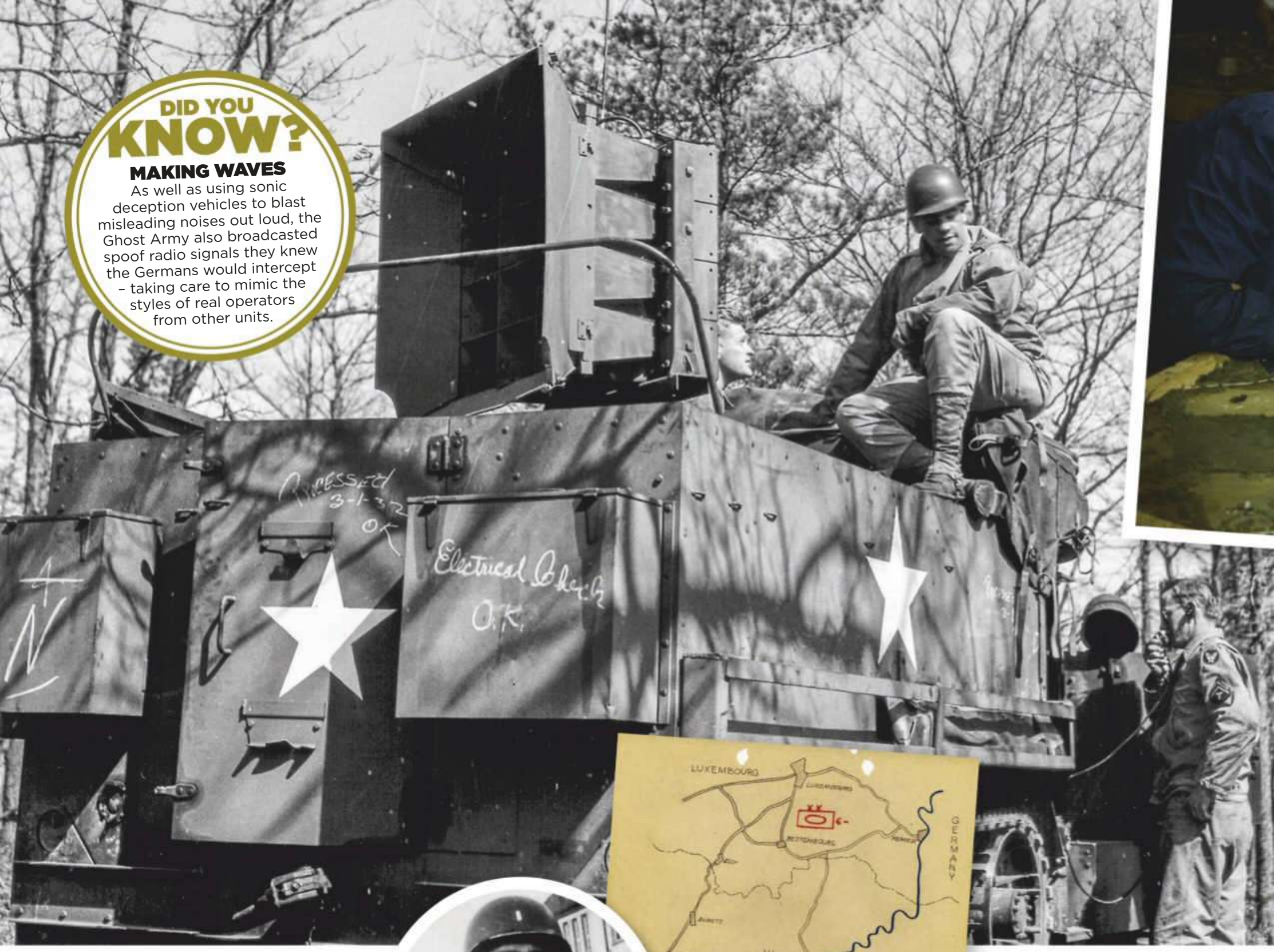
As the Allies pushed through Europe at the end of World War II, they needed a secret weapon to stay ahead of the German war machine. **Gavin Mortimer** tells the story of the 'Ghost Army' – a talented band of artists and engineers who created the ultimate distraction

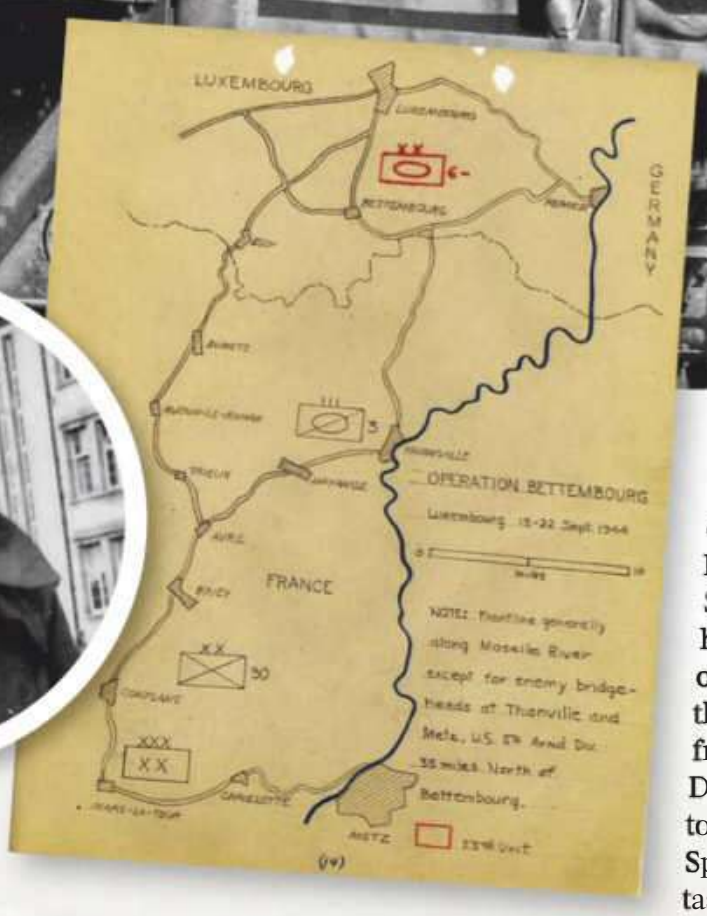
GHOST ARMY LEGACY PROJECT X1, GETTY IMAGES X1

## DID YOU KNOW?

### MAKING WAVES

As well as using sonic deception vehicles to blast misleading noises out loud, the Ghost Army also broadcasted spoof radio signals they knew the Germans would intercept – taking care to mimic the styles of real operators from other units.






TOP: **A sonic deception vehicle used by the Ghost Army, capable of projecting sounds to distances of 15 miles**

ABOVE: **Dick Syracuse travelled with the fake 6th Armored Division during Operation Bettembourg**

RIGHT: **A map from the successful operation, showing the position of the Ghost Army near the German border**

By the middle of September 1944 the Allied drive east across France towards the German border had almost reached the end of its tether. The American XX Corps had as its objective the French city of Metz, 20 miles west of the border, but they were thinly stretched against a desperate enemy fighting to defend the Third Reich.

Two US divisions were assigned to the assault on Metz, but the problem facing HQ was the lack of troops at their disposal to guard the 50 miles that lay between the city and the Luxembourg border to the north. This was needed to ensure that the Germans didn't launch a sweeping counteroffensive.

Nevertheless, late in the afternoon of Saturday 15 September, the advance element of the 6th Armored Division began arriving in the wooded land on the outskirts of Bettembourg, a town one mile inside the Luxembourg border.

During the night the sound of armoured vehicles was heard moving into the woods, and when dawn broke on the Sunday, a dozen M4 tanks were visible among the trees. As Lieutenant Dick Syracuse and his platoon manned their positions, they heard from their rear an angry holler.

"What the hell is going on here, son?" Glancing round, Syracuse was confronted by a colonel from a US cavalry unit.

"What do you mean, Colonel?" Syracuse responded.

"What are those tanks doing there?"

Syracuse replied that there were no tanks – at least not real ones.

A look of stupefaction crossed the colonel's face. "I know what I hear!" he snapped. "There are tanks out there, and nobody told me there was going to be tanks here!"

Syracuse sent for his commanding officer, Lieutenant Colonel Edgar Schroeder. When he arrived, he took the cavalry officer to one side and explained who they really were. They weren't from the 6th Armored Division, but instead belonged to the 23rd Headquarters Special Troops. However, their task was to fool the Germans into believing they really *were* from the 6th Armored Division: hence the wearing of their insignia.

As for the tanks themselves, they were rubber ones that had been inflated during the night, and the sound of their 'tracks' was actually an audio recording being played by a sonic deception truck.

"Well," exclaimed the colonel, "you certainly could have fooled me."

### PRETENDERS ASSEMBLE

Captain Ralph Ingersoll and Colonel Billy Harris of the 12th US Army Group Special Plans branch (*see box on opposite page*) would have been delighted with the colonel's embarrassment. If they had

Artists paint a 3D relief map during a New York University camouflage class, March 1943

Soldiers from the 603rd Engineer Camouflage Battalion, whose men formed the bulk of the Ghost Army

> "If Ingersoll and Harris had fooled one of their own, then surely they could trick the Germans too"

## AN UNLIKELY DUO

### Despite their differences, the brains behind the Ghost Army were a perfect partnership

Described in his 1985 obituary in the *New York Times* as a "tall, slender man with a voluminous memory, a combative spirit and an intense interest in the people and events that shaped his times", Ralph Ingersoll turned 41 on the day America declared war on Japan on 8 December 1941. He volunteered despite his age and became a controversial staff officer with a habit of "playing fast and loose with the truth" – a reputation he had also earned as a journalist during the 1930s, when he served as a publisher of *Time* magazine and as one of the founders of *Life* magazine.

The turning point in Ingersoll's military career came when he was posted to London as a member of the US Army's 'Special Plans' branch, answering to Colonel Billy Harris. A professional soldier who was the opposite in temperament to Ingersoll, Harris nonetheless encouraged his subordinate's creative thinking, and between them, they conjured the idea of a Ghost Army that could be deployed to deceive the enemy ahead of the invasion of Europe.

In the words of Ingersoll, it was to be a "super-secret battalion of specialists in the art of manipulating our antagonists' decisions".

ABOVE: **Billy Harris was one of the key figures at the London-based Special Plans branch**

LEFT: **Press baron Ralph Ingersoll helped Harris concoct the Ghost Army**

fooled one of their own, then surely they could trick the Germans, too and their creation did, on many occasions, during the final year of the war in Europe.

The pair's commanding officer, General Dan Noce, answered to General Jake Devers, who commanded US Army forces preparing for the Normandy invasion, and they both saw the potential of a unit dedicated to deceiving the enemy. The difference between what Ingersoll and Harris proposed to previous acts of military subterfuge was outlined in the so called Ghost Army's official history, written in September 1945 by Captain Fred Fox: "[Previous] deceptive efforts were handled by a small group of officers with pick up detachments," he wrote. "Some observers felt that deception could be strengthened and its employment widened, by the formation of a self contained unit especially and solely designed for tactical deception. This group would serve as a nucleus of experts and its T/E [Table of Equipment] would be loaded with tricky devices."

This unit, designated the 23rd Headquarters Special Troops, was activated by the War Department on 20 January 1944. Its commander was Colonel Harry Reeder, a veteran officer who was selected to lead the Ghost Army because he had proved himself an adaptable and original thinker. Recruits came from four existing units: 379 soldiers from the 603rd Engineer Camouflage Battalion; 296 from the 244th Signal Operations Company, 168 from the 293rd Engineer Combat Battalion and 145 men from the 3132nd Signal Service Company.

It was a melting pot of skills: artists and designers adept at camouflage, radio hams adroit at communications and engineers who could create anything from nothing.

### THE ART OF WAR

Several members of the 603rd Engineer Camouflage Battalion were recruited from the Industrial Camouflage Program, a scheme started in 1940 at Pratt School of Art in Brooklyn. One such recruit was Seymour Nussenbaum, who had ▶

## GHOST ARMY IN NUMBERS

**1944**

The 23rd Headquarters Special Troops was activated at Camp Forrest, Tennessee, on 20 January 1944

**23**

Although officially designated the 23rd Headquarters Special Troops, the unit was nicknamed the 'Ghost Army'

**4**

The Ghost Army recruited from four established units, including the 3132nd Signal Service Company and the 603rd Engineer Camouflage Battalion

**57**

Colonel Harry Reeder was the only officer of the unit, and he initially had 57 enlisted men under his command

**93**

One deception weapon was the inflatable M4 tank, which weighed a mere 93 lbs rather than the 'real' 32 tonnes

**1,105**

By the time the unit had shipped to France, its strength had grown to 82 officers and 1,023 enlisted men

**46**

The diverse unit brought together artists, students and bartenders from 46 US states

**20**

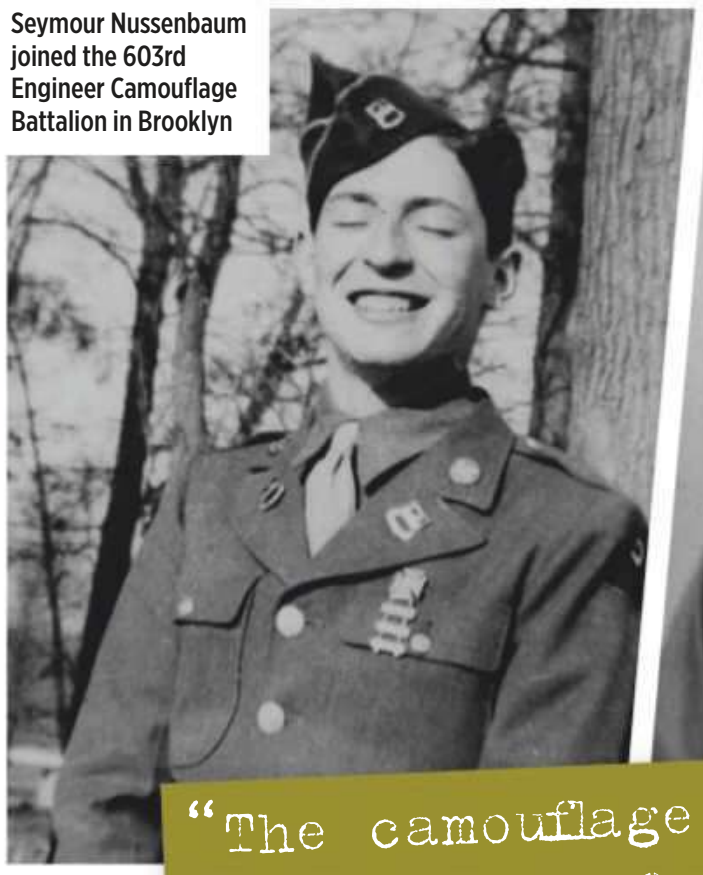
During the course of the war, the unit staged 20 deception operations in France, Belgium, Luxembourg and Germany

**119**

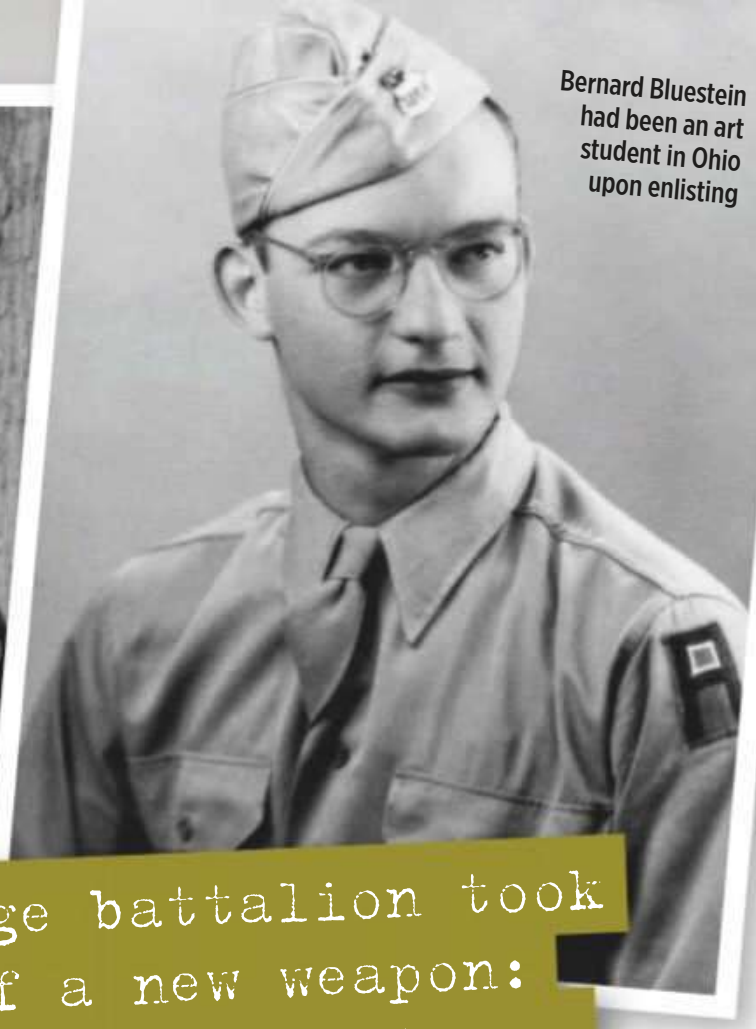
The average IQ for members of the 603rd Engineer Camouflage Battalion was 119

**1996**

The activities of the Ghost Army remained a closely guarded secret until their official history was declassified in 1996



Seymour Nussenbaum joined the 603rd Engineer Camouflage Battalion in Brooklyn



Bernard Bluestein had been an art student in Ohio upon enlisting

"The camouflage battalion took delivery of a new weapon: inflatable rubber imitations of military hardware"

been enduring the miserable life of an artilleryman before he had heard of the call for artists. "You had to be transferred into this unit because it had a high priority," he reflected many years later. "They didn't tell us much because it was a slow evolution. They had never tried anything like it before."

Another recruit was Bernard Bluestein, who was midway through his second year at the Cleveland Institute of Art in Ohio when he heard the army were on the lookout for talented artists. Realising it could keep him out of an infantry unit, Bluestein volunteered and was sent on a camouflage course before he joined the 603rd Engineer Camouflage Battalion. "We learned how to camouflage ourselves, and with buildings, we carried it a little further," Bluestein said. "We had to build fake army equipment: tanks, jeeps, trucks, artillery, airplanes. We made these out of wood."

While the members of the 603rd Engineer Camouflage Battalion mastered their craft, recruits to the 3132nd Signal Service Company visited military camps in the US to record the noise of armoured vehicles and infantry soldiers. With the help of top civilian sound engineers, the signallers then mixed these sounds with the situation they wanted (such as the digging of defensive positions) in what was called 'sonic deception'.

On 2 May the Ghost Army was spirited out of New York on board the USS *Henry Gibbons*. Unlike other soldiers being shipped overseas there was no fanfare on the quayside; like all good phantoms they came and went in the night.

Once in England the camouflage battalion took delivery of a new weapon: inflatable rubber imitations of military hardware. "The dummies were usually inflated by air compressors," explained Nussenbaum. "They ran off batteries or they plugged them into a car. When those didn't work, we had bicycle pumps, and if that didn't work, you blew them up with your lips!"

The fighter planes and tanks were not just easier to construct, they gave the Ghost Army more time to devote to other deceptions, including creating replica insignia and uniforms of frontline units that they may be asked to impersonate.

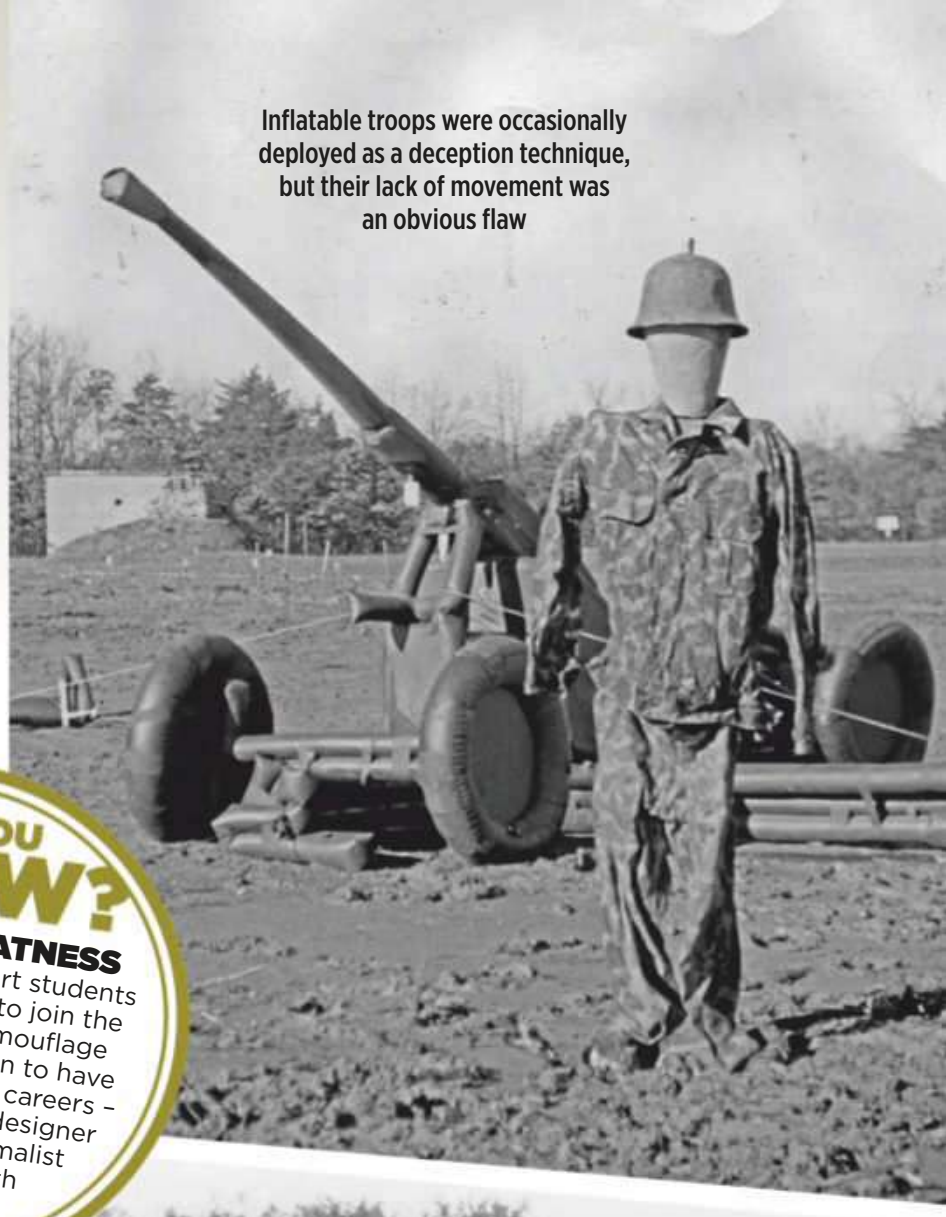
### BAFFLEMENT IN BRITTANY

A small advance party from the 23rd Headquarters Special Troops was deployed to France shortly after D-Day on 6 June, and the rest of the Ghost Army followed. But it was to be a frustrating few weeks, as the official history noted: "Much time was spent looking for jobs, but the Normandy build-up simply did not lend itself to deception. At least, no one with sufficient influence thought it did. The 23rd was told to wait for the expected 'break-through'."

Nevertheless, there were occasional moments of comedy to lighten the men's mood. Gilbert Seltzer recalled the afternoon that he and a buddy were told to move an inflatable tank into a new position. As they picked up the tank, they heard a cry of incredulity from a passing Frenchman. "Americans are very strong!" shouted Seltzer, and the Frenchman ran off to tell his neighbours of the supermen in their midst.

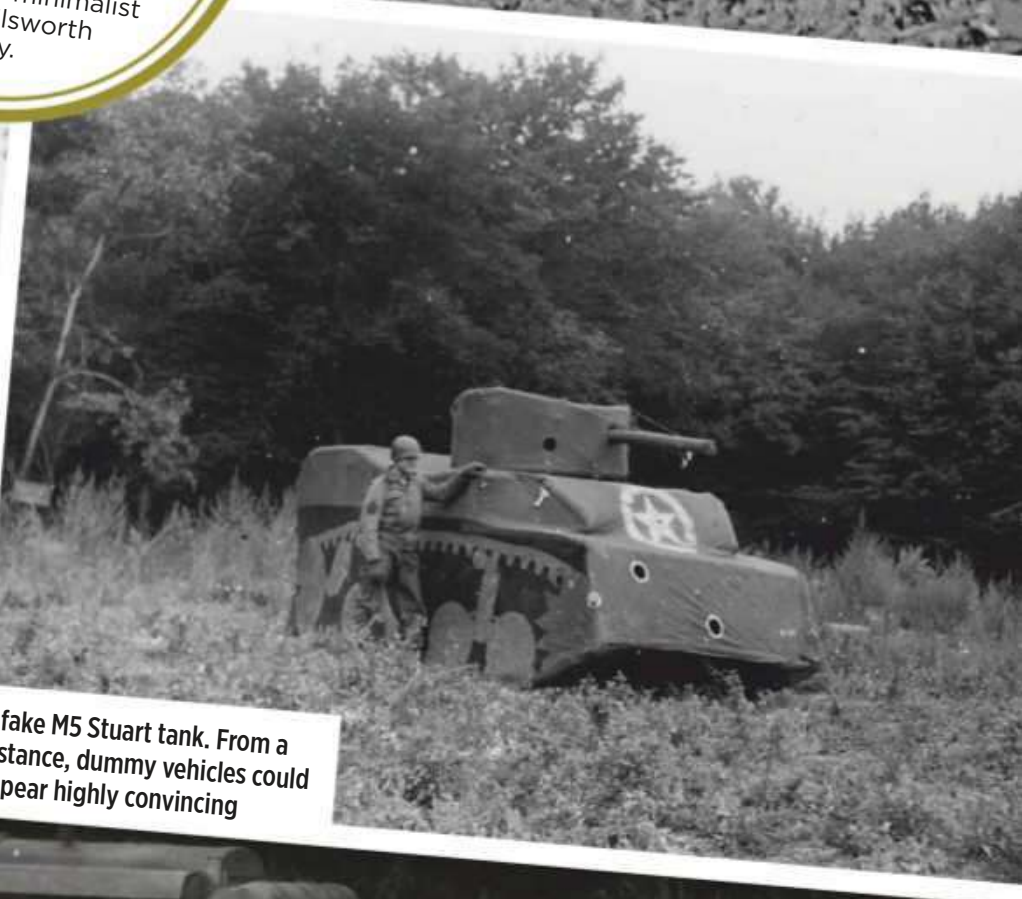
The 'break-through' was finally achieved at the end of July as General Omar Bradley's army smashed the

▲ A fake Ghost Army vehicle is unrolled on the ground prior to inflation



Inflatable troops were occasionally deployed as a deception technique, but their lack of movement was an obvious flaw

▲ If battery pumps failed, vehicles – like this truck – were sometimes inflated "with your lips"



A fake M5 Stuart tank. From a distance, dummy vehicles could appear highly convincing

**DID YOU KNOW?**

**PATH TO GREATNESS**

Some of the young art students who were recruited to join the 603rd Engineer Camouflage Battalion would go on to have successful peacetime careers – such as the fashion designer Bill Blass and minimalist painter Ellsworth Kelly.

A soldier proudly poses in front of an inflatable rubber plane, although wooden models were sometimes also used

Dummy tanks being placed in position along the Rhine during Operation Viersen, March 1945

stalemate, and in the space of a week, covered more than 60 miles into Brittany. The Ghost Army was tasked with tricking the Germans into believing that Bradley's priority was to clear the Brittany peninsula, while in reality it was to thrust south.

Forming into four notional battle groups, the Ghost Army ranged across Brittany, often at night, using their sonic deception to create the sound of a huge armoured force on the move. Reconnaissance patrols displaying fake insignia would carry out missions aware that they were under enemy observation. According to the official history: "While the 23rd does not hold itself responsible for the destruction of the German Seventh Army, there is always a possibility that its ruse helped becloud the German estimate of the situation."

> "The story of the Ghost Army was kept secret in case a similar unit was needed in the Cold War"

Policemen, arriving to empty the cafes of Bettembourg of soldiers and ordering them to return to their positions. "Civilians were observed photographing bumpers, taking notes, and asking 'friendly' questions," recalled Lieutenant Colonel Clifford Simenson.

The Ghost Army had been instructed to plug the line north of Metz for 48 hours until the arrival of the 83rd Infantry Division, but they were delayed. Fear grew that the Germans would rumble the ruse and launch an attack against soldiers ill equipped materially and physically to resist an assault. But the attack never came, and on 22 September the 83rd Infantry finally arrived.

## KEEPING UP APPEARANCES

Later in August the Ghost Army deployed a fake artillery battery against the Germans in Brittany, emitting the flashes and noises of heavy guns half a mile in front of a German artillery battalion. Over three nights the fake battery was targeted by the German howitzers who believed them to be real.

A month later the Ghost Army was supporting XX Corps as they attempted to liberate Metz. Once the red-faced cavalry colonel had departed, the men of the 23rd began cooking breakfast, sparking up stoves as if they were a brigade and not a battalion. Later, some of the soldiers strolled into Bettembourg, where it was known there were enemy spies. They wore the shoulder patches of the 6th Armored, and in the cafes and bars they boasted of their Division's reputation – information they knew would be passed on to the Germans.

Ghost Army personnel even impersonated 6th Division Military

## VOW OF SECRECY

The Ghost Army continued to distort reality as the Allies advanced into Germany. In March 1945 the camouflage battalion pretended they were two crack divisions preparing for an assault against Viersen. As the Nazis focused their energies on defending the town, the 9th Army crossed the Rhine five miles to the east. "We went into town at dusk when no one could see us, but we had a sound system that had the sounds of troops moving," recalled Bernard Bluestein. "We were only about 1,100 men. We simulated two divisions of 30,000."

The next morning the Germans began shelling the Ghost Army, which Bluestein saw as a badge of honour. "[It] gave us the indication that we convinced them that we were the real outfit."

When the war ended a few weeks later, the 23rd Headquarters Special Troops shipped back to the US, and Bluestein and Nussenbaum returned to art college. For decades, the story of the Ghost Army was kept secret in case a similar unit was needed in the Cold War, so Nussenbaum came up with a typically imaginative way to explain his wartime exploits.

"When they asked me what I did, I said 'I blew up tanks', which wasn't a lie. And it sounded good."

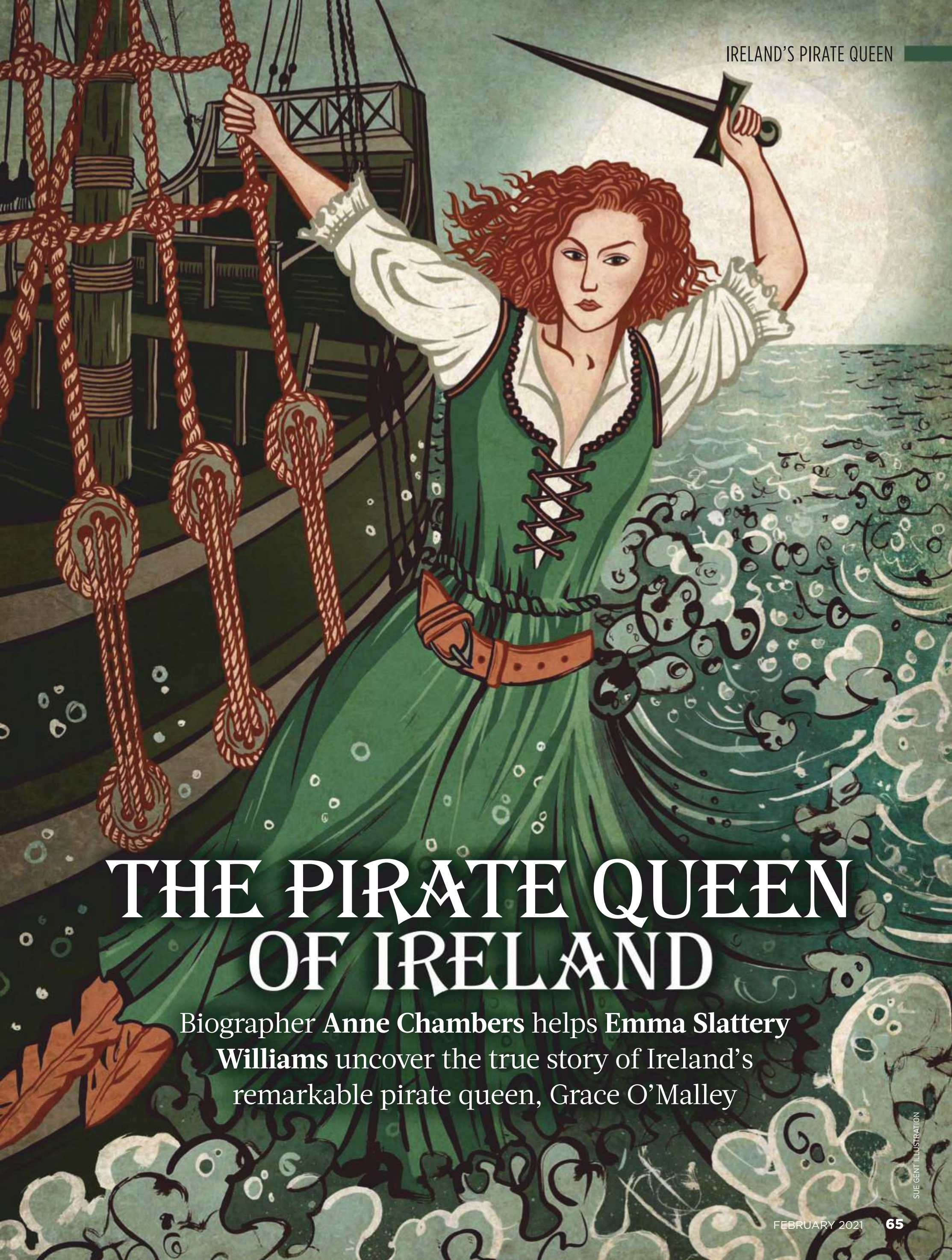
## GET HOOKED

**ONLINE**

For more information on the World War II Ghost Army, visit the Ghost Army Legacy Project website: *ghostarmylegacyproject.org*

Ghost Army veterans (L–R) Stanley Nance, Bernard Bluestein and Seymour Nussenbaum reminisce in March 2020

GHOST ARMY LEGACY PROJECT X1, DANIEL ZIV X1



# THE PIRATE QUEEN OF IRELAND

Biographer **Anne Chambers** helps **Emma Slattery Williams** uncover the true story of Ireland's remarkable pirate queen, Grace O'Malley

SUE GENT ILLUSTRATION

Grace O'Malley had given birth just hours earlier, but as she stood on the deck of her ship, the fearless pirate queen knew there was no time to rest. A band of other pirates had attacked and boarded her vessel, and she had to lead her crew against them and protect her newborn son. O'Malley grabbed her sword and rallied her men for a counterattack. By the time the fighting was over, she had captured the other pirate ship for herself.

A fascinating description was recorded by Sir Henry Sidney, Lord Deputy of Ireland, who met O'Malley in 1577: "A most famous, feminine sea captain… famous for her stoutness of courage… commanding three galleys and 200 fighting men… This was a most notorious woman in all the coasts of Ireland."

Gráinne Ni Mháille, anglicised to Grace O'Malley, led her own fleet with hundreds of men, spent nearly a lifetime at sea, and came face to face with one of the most powerful monarchs of the age, a woman she regarded as an equal.

Born in around 1530 in County Mayo, in western Ireland, O'Malley was the only daughter of chieftain Dudara O'Malley of the kingdom of Umhall. Ireland had its own distinct legal system known as Brehon Law, in which chieftains were elected instead of the title being passed down by primogeniture (going to the first born son). The more forceful chieftains used a system of clientship, where they offered protection to the smaller clans in return for service and fealty. Women in Ireland, while far from being treated as equal to men, could inherit and hold lands in their own right and even divorce their husbands. They could not, however, become chieftains.

O'Malley was the exception to this last rule; a woman, according to Grace O'Malley's biographer, Anne Chambers, "who broke the mould".

## TAKING TO THE WAVES

The O'Malleys were a sea faring family, who travelled across oceans to trade, taxed for fishing in their waters, occasionally plundered, and controlled coastal castles to protect their lands in western Ireland. As a girl, O'Malley grew up at Belclare Castle and Clare Island, receiving a formal education to the extent that she could speak Latin as fluently as her native Irish. Yet she also grew up on the sea and was determined to follow her family's bearing. When O'Malley was told she could not join her father on a sailing expedition as her long hair would get caught in the ship's ropes, she cut it short and forced him to take her with him.

TOP IMAGE: **The cliffs of Clare Island, where O'Malley grew up and made a base for her life as a pirate**

ABOVE: **Ireland's west coast had long been an O'Malley stronghold**

At 15, O'Malley was married off to Donal O'Flaherty, the heir of a neighbouring chieftain. With him, she had three children two sons, Owen and Murrough, and a daughter, Margaret and learned more of seafaring and piracy. When Donal was murdered by members of a rival clan, in 1560, O'Malley took

GETTY IMAGES X2, ALAMY X3

charge of her late husband's lands and ships. The Joyces, the clan believed to be responsible for Donal's death, thought his castle would be open to capture with no one to protect it. What they had not expected was that Donal's widow would lead his men in defence.

O'Malley returned to her father's lands, with those of Donal's men who remained loyal to her, and made Clare Island her stronghold. Starting with three galleys, she embarked on a career of piracy on the high seas.

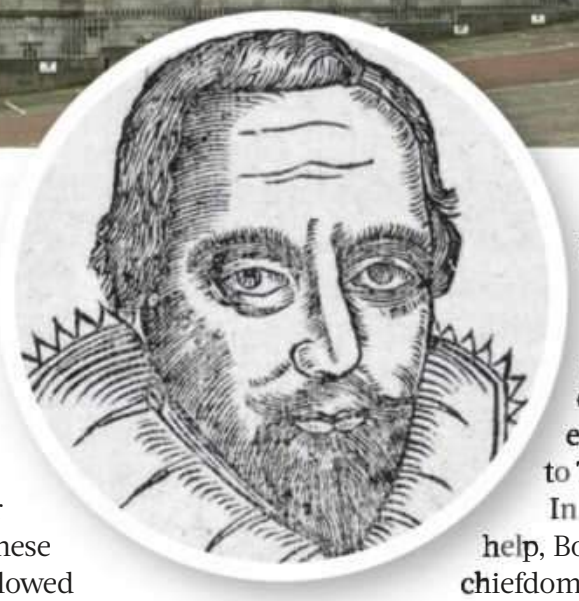
This is where the legend of the pirate queen was born, explains Chambers: "Enduring danger and hardship by land and especially by sea, O'Malley's maritime skill gave her role as leader a double edge. It took immense skill and courage to ply the dangerous Atlantic Ocean and to withstand the physical hardships of life at sea. It is her leadership at sea that sets Grace O'Malley apart from every other documented female leader in history."

## SHREWD AMBITIONS

A fearless leader and also a vengeful warrior, O'Malley did not let any attacks against her go unpunished. When Hugh de Lacy – the man she took as a lover after rescuing him from a shipwreck in 1565 – was killed by the MacMahon clan of Doona Castle, O'Malley took violent retribution. When the MacMahons visited a nearby island, O'Malley was lying in wait with her men and killed all of those involved in de Lacy's death. Her vengeance still not sated, she then defeated the garrison at Doona Castle and claimed it for herself.

By 1566, O'Malley was married again, this time to Richard 'the Iron' Bourke. It's believed that the strategic strength of his castle, Rockfleet, was a motivating factor for the shrewd pirate queen. Bourke, a member of the powerful MacWilliam family, made a perfect political match. The pair entered into a trial marriage – these were common in Ireland and allowed either party to withdraw after a year and when 12 months had elapsed, O'Malley and her men locked her husband out of Rockfleet and demanded a divorce with the words: "I dismiss you". Despite that, the pair would reconcile and remain together for almost 20 years.

O'Malley had a son by Bourke, named Tibbott (anglicised to Theobold). He was born in 1567, aboard one of O'Malley's ships as Barbary pirates were bearing down. Such was her leadership that the captain pleaded with O'Malley to be seen on deck and rally her men just hours after the birth. Wrapping her son in a blanket, and in some pain, she roared out commands and fired at her enemies before returning to Theobold.



ABOVE: **Dublin Castle was reserved for the most notorious prisoners; O'Malley was held there in 1578**

INSET: **Gerald FitzGerald, 15th Earl of Desmond, led two Irish rebellions against English rule**

In 1580, and with his wife's help, Bourke became the heir to the chiefdom of MacWilliam. It was around the same time that the English intensified their conquest of Ireland. Elizabeth I's Lord Deputy of Ireland, Sir Henry Sidney, divided up County Mayo into baronies and demanded that the chieftains submit to English law and accept the arrival of sheriffs in their lands. MacWilliam agreed but O'Malley knew what this meant for her husband. Under English law, the heir would now be the eldest male relative instead of Bourke. To win over Sidney, O'Malley offered him the services of her fleet. He was duly impressed and Rockfleet maintained a degree of autonomy from English control.

**ONE ADVERSARY DESCRIBED HER AS "THE MOST NOTORIOUS WOMAN IN ALL THE COASTS"**

Rockfleet Castle, where O'Malley held off sieges and lived out the rest of her life

## MAKING NEW ENEMIES

O'Malley returned to life on the high seas, but a failed attempt to plunder from the Earl of Desmond in Munster ended in her capture and imprisonment. Desmond, who was under suspicion of being part of a plot against Elizabeth, handed O'Malley to the English to gain favour. She was held in the dungeons of Dublin Castle until early 1579 when she secured her release the details of how remain a mystery. O'Malley responded by attacking English ships and routing the army sent to besiege her castle.

When the chief of MacWilliam died in 1580, Bourke and O'Malley went into rebellion to exert their right to succeed. They mustered a huge army, including the elite Scottish mercenaries called the Gallowglass, and forced a deal to grant Bourke the title. O'Malley, considered by many to be the real power behind her husband, became Lady Bourke and remained a woman to be feared. One story says she threatened an English tax collector and sent him running even

This statue of O'Malley resides in the grounds of Westport House, built by her descendants

Sir Richard Bingham, governor of Connaught, would come up against O'Malley many times

after Bourke had agreed to pay.

But O'Malley's position would not last long, as her husband died in 1583. Finding herself a widow again, she took what she was owed of her husband's property and one of his castles in lieu of her dowry, and established herself with her army and ships at Rockfleet. Her ability to lead and command respect was evident in the number of who men followed her.

"When Gaelic law spurned her as a female chieftain, O'Malley ignored the political and social obstacles placed in her path…" says Chambers. "Such was her influence and power that she became an accepted matriarch, not merely to her own followers, but of neighbouring clans, whose own chieftains had either died or abandoned their obligations to protect their followers."

The English, however, wished to put O'Malley in her place. Sir Richard Bingham, who was made governor of Connaught in 1584, became a lifelong enemy of O'Malley and her family, claiming that she was "nurse to all rebellions in the province for this forty years". In 1586, O'Malley's eldest son, Owen, was killed by Bingham's brother; when a heartbroken O'Malley led a force against Bingham, she was lured into a trap and captured. At the age of 56, she was condemned to death, before her son in law, Richard, managed to persuade the English that he was not part of any rebellion and would keep O'Malley in his custody.

## A ROYAL APPOINTMENT

In reality, once freed, both rejoined the rebels. In 1587, O'Malley took advantage of Bingham being sent away to visit his rival, the new Lord Deputy of Dublin, Sir John Perrot, who pardoned her for all her past offences, as well as those of her children. The official line now was that O'Malley would retire to live a quiet life and stop her plundering at sea. This was far from the truth.

In the summer of 1588, Bingham returned to Ireland amid fears that the Spanish Armada would find Irish supporters. Skirmishes between his forces and O'Malley's continued for several years until he destroyed part of her fleet of galleys in the early 1590s.

Not one to admit defeat, O'Malley bypassed Bingham and appealed directly to his boss. Her first of many letters to Queen Elizabeth I show a mind as Machiavellian and sophisticated as that of Elizabeth and her court.

"O'MALLEY DID NOT CONFORM TO THE GOD-FEARING AND DUTIFUL IMAGE OF GAELIC WOMANHOOD"




LEFT: **An illustration of the historic meeting between the Queen of England and Ireland's pirate queen**

RIGHT: **An O'Malley family crest at Clare Island Abbey, under which it is said their most famous member is buried**

In the letter, O'Malley sets out her own version of events, which, as she writes, "constrayned her to take up armes", laying the blame squarely at Bingham. In retaliation, Bingham captured her son, Theobold, and accused him of treason a crime punishable by death.

To save the life of her son, O'Malley followed her correspondence to the royal court, and with the assistance of her friend, the influential Earl of Ormond managed to get an audience with Elizabeth in Greenwich in July 1593.

Yet, staring across the chamber at the queen, she was not intimidated instead, defiant and determined. Both women were the same age, and both queens in O'Malley's eyes. Elizabeth wore an exquisite dress, wig and make up, while O'Malley let her age show. It was clear she was no ordinary woman. As the queen could not speak Irish, they resorted to a language they both knew. Chambers elaborates: "Tradition holds that Elizabeth and O'Malley conversed in Latin, however, both from her correspondence and the reports of those who came into contact with her, it is obvious that O'Malley both understood and spoke English."

## KINDRED SPIRITS

Elizabeth was in awe of this woman a fellow female leader in a male dominated world and took pity on O'Malley. The queen allowed her to return to 'maintenance by land and sea' an authorised form of piracy allowing O'Malley to recover her losses and called for Theobold's release. Such was the impression made on Elizabeth that when a new map of Ireland was drawn, O'Malley was named as chieftain of Mayo.

O'Malley continued leading her men at sea until well into her sixties, but a new century brought great change. The battle of Kinsale in 1602 put an end to rebellion and left Ireland to fall into English hands, and the Gaelic way of life O'Malley and her ancestors had lived by crumbled. In 1603, O'Malley died at Rockfleet, the same year as Elizabeth.

O'Malley's story is not widely known; her legacy has survived through the folktales and songs of Ireland. "Grace O'Malley did not conform to the patriotic, God fearing and dutiful image of Gaelic womanhood promoted by later generations of Irish historians and was consequently airbrushed," concludes Chambers.

## GET HOOKED

*Grace O'Malley: The Biography of Ireland's Pirate Queen, 1530–1603* (Gill Books, 2018) by Anne Chambers

An upcoming episode of the *You're Dead to Me* podcast will explore O'Malley's life on BBC Radio 4

ALAMY X4

# WHAT IF... JULIUS CAESAR HAD NOT BEEN ASSASSINATED?

**Jonny Wilkes** talks to **Professor Barry Strauss** about how Caesar could have survived the Ides of March and why it may not have affected the move from republic to empire anyway

The line "Beware the Ides of March", in William Shakespeare's play *Julius Caesar*, has immortalised the date as one of the most famous in history. For while the titular statesmen and most powerful man in the Roman republic did not heed the soothsayer's prophetic warning, or the pleas of his wife not to go to the Senate, we know the reason why Caesar had to beware 15 March 44 BC.

A group of senators, including former allies of Caesar, conspired against him as they had grown fearful that his dictatorial rule threatened the republic. No one, many believed, should wield too much power. Led by Brutus, Cassius and Decimus, no fewer than 60 assassins approached Caesar during a Senate meeting on the Ides of March, and attacked with daggers that had been concealed in their togas. Caesar was powerless to withstand the frenzied thrusts and died with 23 wounds.

But if Caesar acted on the warnings or had not insisted on being seen without bodyguards, he may have discovered the conspiracy before it took place. "If he had read the note by Artemidorus of Cnidus [warning him of the danger] and believed it, then he would have known about the plot," says Barry Strauss, professor of history and classics at Cornell University and author of *The Death of Caesar* (Simon & Schuster, 2015). In that case, Caesar's retaliation would have been swift, with suspected assassins arrested, tried and executed.

Another scenario was that, had the attack still occurred, Caesar's co consul Mark Antony could have intervened, instead of being distracted by one of the conspirators, Trebonius. "As consul, Antony would have been on the podium next to Caesar. He was strong, fit and a military man, so knew how to react to violent danger," says Strauss. "He could have given aid to senators who tried to help Caesar. We know of two such men, Lucius Marcius Censorinus and Gaius Calvisius Sabinus, and there may have been others."

Had the attempt on his life been averted, whatever the means, Caesar would have meted out punitive punishments on the rebellious senators and continued his rule as *dictator perpetuo* or 'dictator for life'. He had already implemented a number of populist reforms including land redistribution from the elite to the poor and soldiers, and increased citizen enfranchisement and was likely to have continued a reorganisation of the republic.

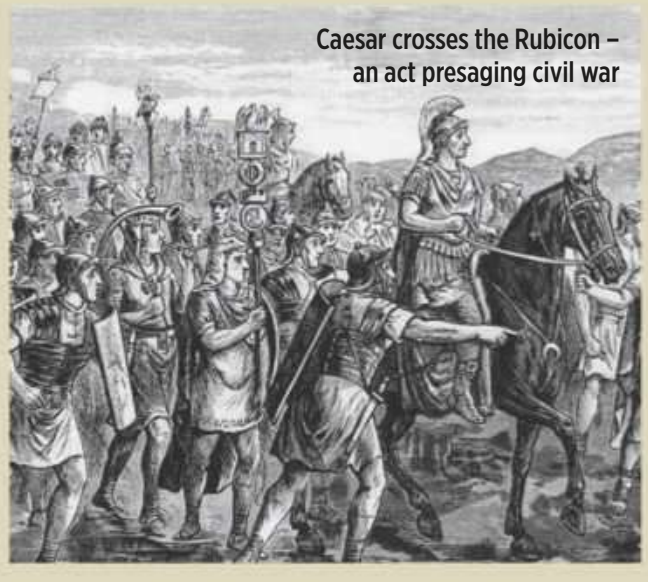
Caesar's attention would quickly have turned to his planned three year military campaign against Dacia (in the Balkans) and Parthia (roughly, modern day Iraq and Iran). He had arranged to depart just a few days after the Ides of March, first for Greece to meet the huge force already in training. With an estimated 16 legions and cavalry, Caesar had reason to be confident of pacifying Dacia, led by King Burebista, and annexing the land like he did in Gaul, but Strauss stresses it would have been far from an easy victory. "In the second century, Emperor Trajan had to fight two campaigns to conquer Dacia," Strauss notes.

The next target was Parthia. The Romans sought revenge for the defeated invasion commanded by Marcus Licinius Crassus one of Caesar's partners in the First Triumvirate and Caesar sought his own reprisals as the Parthians had sided with his enemy, Pompey, in the civil war that brought him to power. "It's hard to imagine any circumstances in which Rome could have conquered Parthia. They were never a pushover," says Strauss. "Caesar may have won a battle and perhaps

## IN CONTEXT

By 44 BC, Julius Caesar ruled as dictator of the Roman republic. The previous decade had seen the powerful statesman command his own army with indomitable success – conquering Gaul, repelling Germanic tribes, and launching invasions of Britain – which made him popular among the people and inspired loyalty from his troops. Caesar then defied the authority of the Senate, crossing the Rubicon with his army and sending the republic into civil war.

While he emerged the victor, his time as *dictator perpetuo*, dictator for life, was brief. A conspiracy formed to overthrow Caesar and restore the power of the republic. In 44 BC, on 15 March – the Ides of March – a group of 60 senators, armed with daggers and led by Brutus, Cassius and Decimus, assassinated Caesar. Years of civil war followed his death until Octavian, Caesar's adopted heir, rose from the ashes of the republic as Augustus, the first Roman emperor.



Caesar crosses the Rubicon – an act presaging civil war

GETTY IMAGES X2

Caesar falls beneath the blades of his assassins in this painting by Vincenzo Camuccini, dated c1806

driven them out of a border region, at least temporarily. That might have been enough for the sake of honour."

The Dacia and Parthia campaigns could have helped secure Caesar's rule, but only if the news coming back to Rome was of victories. "If they went well, it was unlikely that opponents could have achieved much," says Strauss, despite the fact Caesar would still have had enemies even after squashing the assassination attempt. "If the campaigns had gone badly, then they might have been able to seize control of the political system, while hoping for Caesar's failure."

"Cicero thought Caesar never would have returned to Rome," says Strauss. "He doesn't explain this opinion, but Caesar certainly had health problems. Had he not returned, the upshot was a renewal of civil war." There were still ambitious rivals, who had three years to gather strength, so a returning Caesar needed to assert his position, according to Strauss, by grappling with the conversion of the "government of a city into government of an empire". He adds: "That sort of work bored Caesar, so it's not clear whether he would have been up to the task."

**DID YOU KNOW?**

**WARNINGS IGNORED**

The day of his assassination, Caesar's wife Calpurnia awoke from a nightmare in which Caesar had died, and pleaded with him not to go to the Senate that day. He agreed, but Decimus, one of the conspirators, came to his house and convinced him to attend.

## "CAESAR'S ATTENTION WOULD QUICKLY HAVE TURNED TO HIS PLANNED MILITARY CAMPAIGN AGAINST DACIA AND PARTHIA"

In the long run, the move from republic to empire may not have been all that different had Caesar lived, seeing that he would have still been succeeded by his adopted heir Octavian, whom we now know as the first emperor, Augustus.

Mark Antony was always going to be a prominent politician, just unlikely to be at the "acme of power, since Caesar had only limited respect for him". Although, this could have changed had Antony saved his life on the Ides of March.

Caesarion who was probably Caesar's son – would likely have grown up to be king of Egypt, according to Strauss, "eventually replacing his mother, Cleopatra". If Caesar had continued his relationship with the famed beauty, she may not have begun her affair with Antony at all and her self inflicted death immortalised by Shakespeare, much like the Ides of March – may never have happened.

**LISTEN**

Melvyn Bragg and his guests discuss Julius Caesar on an episode of *In Our Time*.

*bbc.co.uk/programmes/b04jlygw*

**NEXT MONTH**

**What if... the Romans had won at Teutoburg Forest?**

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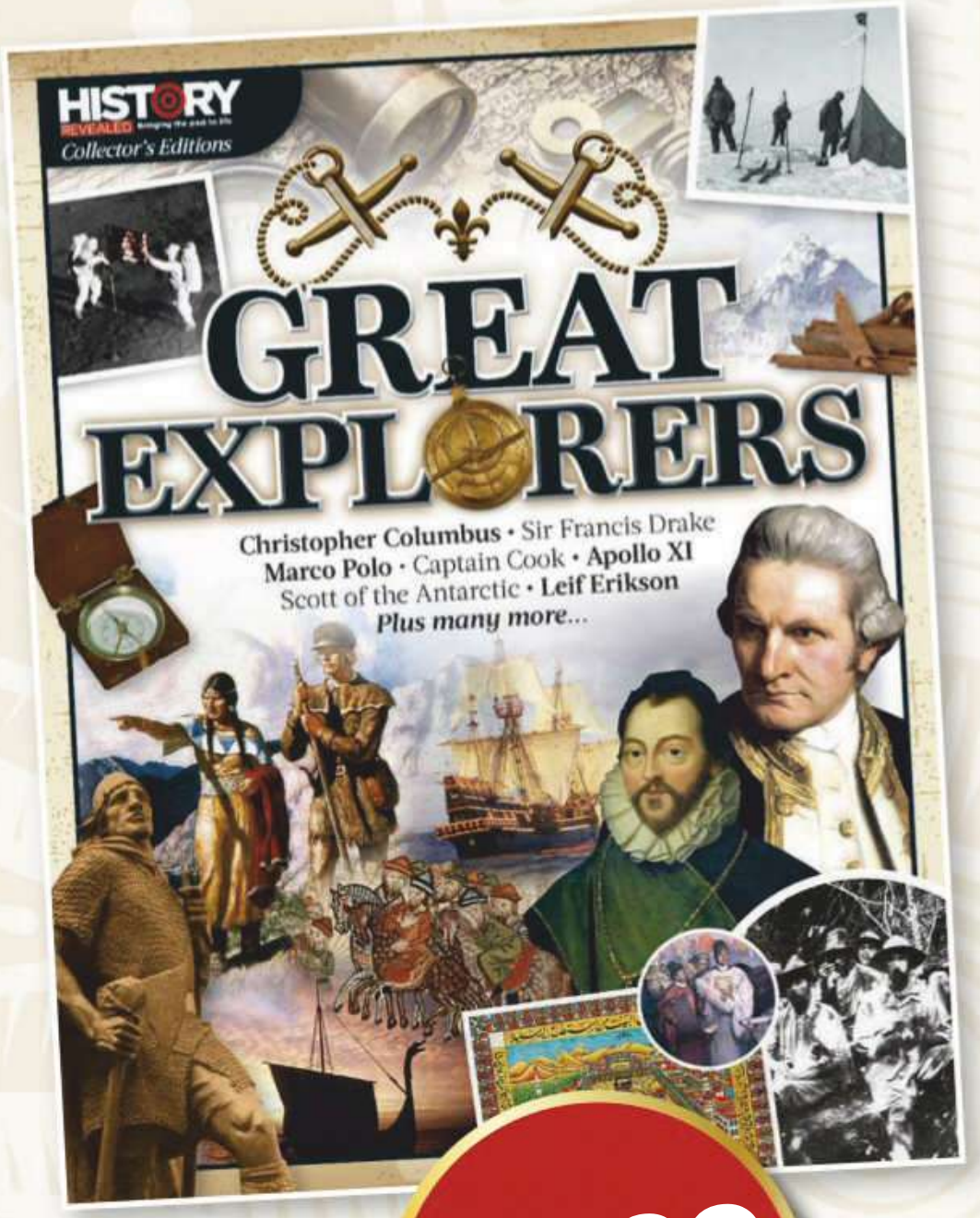
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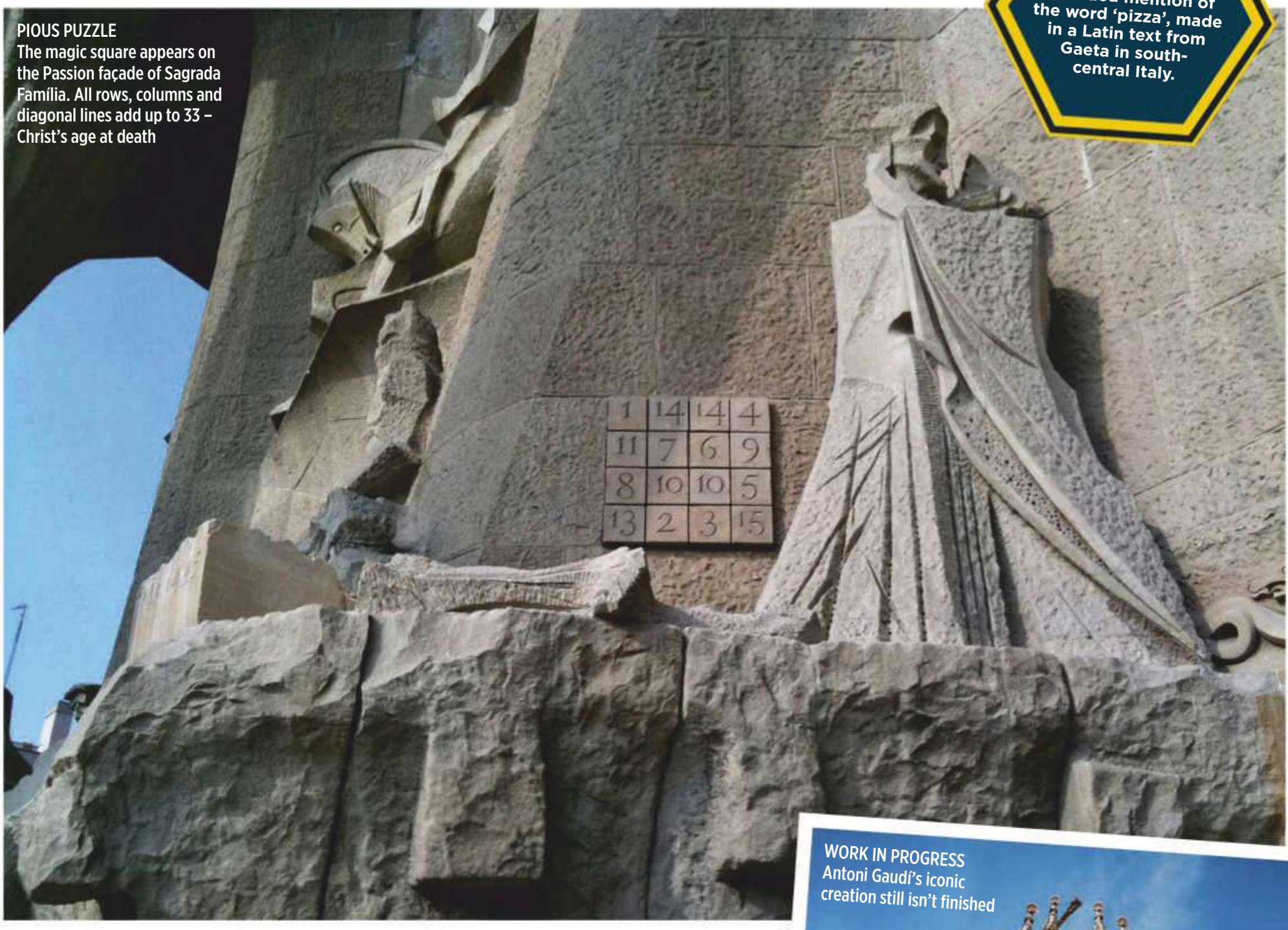
**997**

The year of the first recorded mention of the word 'pizza', made in a Latin text from Gaeta in south-central Italy.




PIOUS PUZZLE
The magic square appears on the Passion façade of Sagrada Família. All rows, columns and diagonal lines add up to 33 – Christ's age at death

# What are those unusual numbers on Sagrada Família?

**SHORT ANSWER** They're not hymn numbers or religious dates. They're a small, yet magical, symbol of devotion

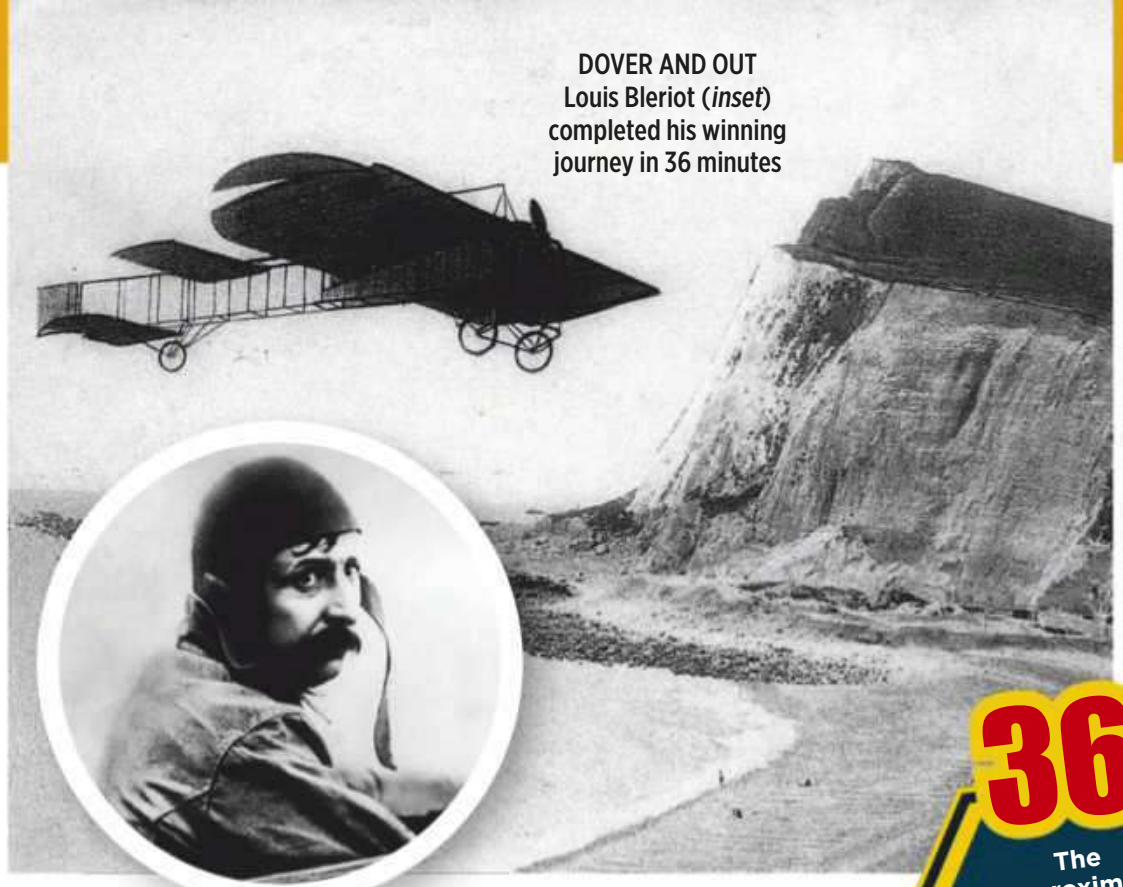
**LONG ANSWER** Construction began on Antoni Gaudí's gothic masterpiece, the Expiatory Temple of the Holy Family – or Sagrada Família – in 1882, and the architect lived to see just one of 18 planned spires erected. Much of the look of the Barcelona landmark, scheduled for eventual completion in 2026, has been to Gaudí's designs, but not all of it.

A singular addition can be spotted on the building's Passion façade: a 4x4 grid of numbers, seemingly with no connection or meaning. It's a magic square, where each of the rows, columns and diagonal lines add up to the same number. Although the sum on most 4x4 magic squares is 34, the Sagrada Família square is unusual as it doesn't use all the numbers 1 to 16, and the magic number is 33, the age of Jesus Christ at the time of his crucifixion. There are a heap of other ways to make 33 using the numbers on the square as well – 310, in fact.

Josep Maria Subirachs, the sculptor working on the cathedral from 1986, added the square after taking inspiration from a 1514 engraving, *Melencolia I*, by Albrecht Dürer. Subirachs was a controversial figure, however, as he refused to make concessions to Gaudí's style, so who knows what the famed Catalan architect would have thought of the magic square.

WORK IN PROGRESS
Antoni Gaudí's iconic creation still isn't finished

1 X GETTY IMAGES, 1 X ALAMY



DOVER AND OUT
Louis Bleriot (*inset*) completed his winning journey in 36 minutes

# Who was the first to fly over the Channel?

**SHORT ANSWER** The French ruled the skies over the Channel in the early days of aviation

**LONG ANSWER** It depends on the mode of transport. By gas balloon, Frenchman Jean-Pierre Blanchard and American John Jeffries completed the feat on 7 January 1785 as air travel was, well, taking off. The first plane crossing came more than 120 years later, by another French aviation pioneer.

After the owner of the *Daily Mail* newspaper, Lord Northcliffe, offered a series of prizes for flying firsts, inventor Louis Blériot set out to win the £1,000 for Channel-hopping in an aeroplane. Aboard his 25-horsepower Blériot XI, he took off from Calais on 25 July 1909. The flight didn't go to plan – he was on crutches after an earlier accident and got lost without a compass – but he made it to Dover after some 36 minutes, before eventually crash landing.

Blériot pipped fellow Frenchman Hubert Latham to the prize by taking off at dawn. Latham, believing the weather that day would be bad, was actually still in bed when Blériot made it to England.

**36**

The approximate radius, in metres, of the sextant built for the observatory of 15th-century Timurid sultan and gifted astronomer, Ulugh Beg.

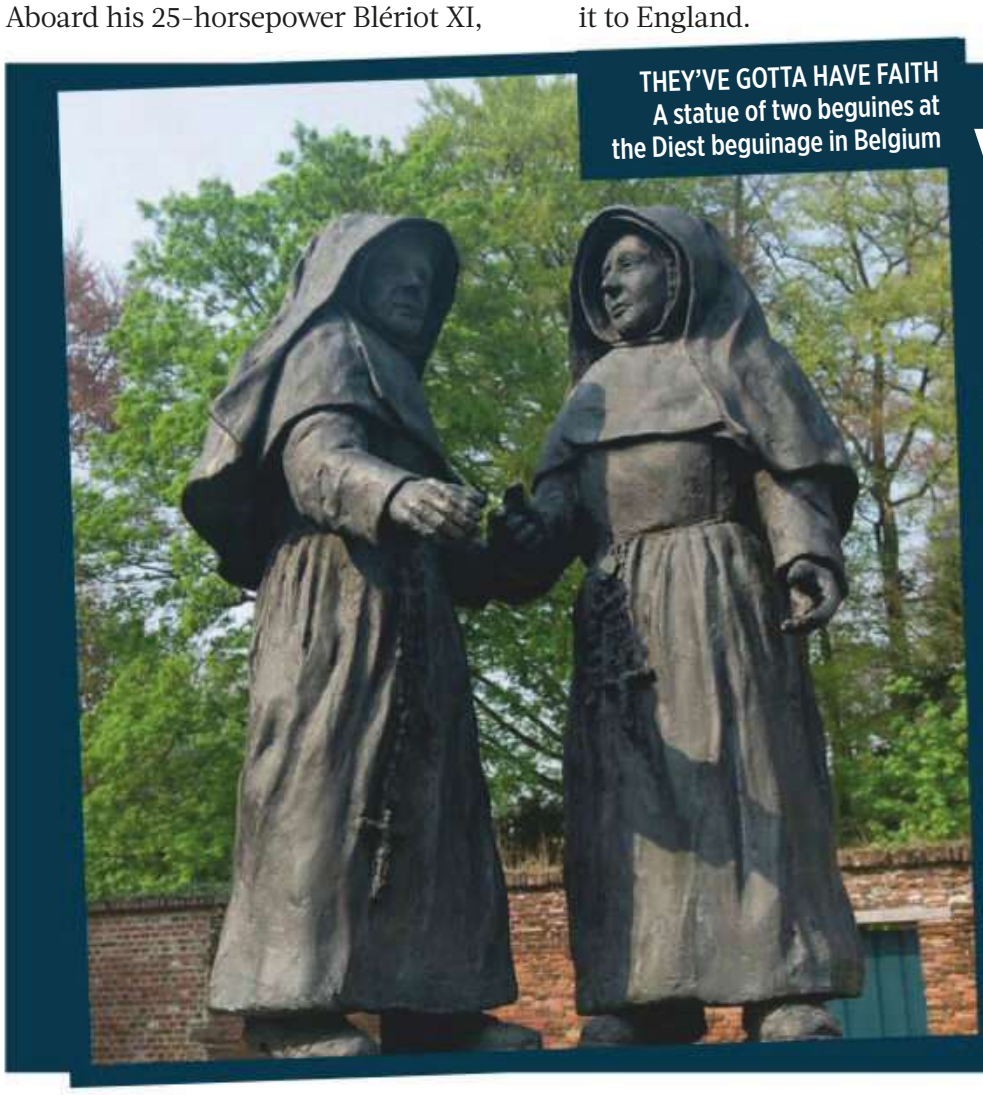
# Why did Betamax lose to VHS?

**SHORT ANSWER** Betamax had the quality, VHS had the quantity

**LONG ANSWER** It has long been said that Betamax was the superior technology in the videocassette format war. Sony launched their cassette and recorder in 1975, confident that they had the higher quality recording, picture and sound – but within a couple of years, a rival had left Betamax reeling.

The Video Home System (VHS) by JVC was cheaper and recorded longer, allowing people to keep a copy of entire movies or sports matches at home for the first time. While a rumour has persisted that VHS also succeeded thanks to Sony's refusal to let pornography companies use Betamax, this was unlikely to have had much effect. VHS was simply more accessible, meaning that by 1987 some 95 per cent of all VCRs in the world used the VHS format.

TIME TO REWIND
Sony's Betamax struggled to compete with JVC's rival system



THEY'VE GOTTA HAVE FAITH
A statue of two beguines at the Diest beguinage in Belgium

# Who were the beguines?

**SHORT ANSWER** Being a beguine meant devoting oneself to God, just without the vows, dress and rules of a nun

**LONG ANSWER** In medieval Europe, especially the Low Countries, groups of women came together in the name of God, but didn't want to be nuns. They formed quasi-monastic communities to practise voluntary poverty and chastity, care for the sick and poor, and commit themselves to religious devotion. They also wrote on theology and translated parts of the Bible into the vernacular.

Some communities or 'beguinages', like Begijnhof in Amsterdam, were walled-off areas of a town, allowing for a degree of self-governance, where beguines were not bound to strict rules and could leave at any time.

They did not find universal support from the church. Some denounced beguines – or the male equivalent, beghards – as heretics and mystics. In 1310, Marguerite Porete was burned for heresy in Paris, and the Council of Vienne ordered the beguines to disband the following year.

But that did not get rid of them. The last traditional beguine, Marcella Pattyn, died in 2013.

GETTY IMAGES X6, ALAMY X2

VERY GOOD BOYS
The dogs rescued people in a snowy area named after Saint Bernard of Menthon (*inset*)

# How did Saint Bernards get their name?

**SHORT ANSWER** The cuddly canines made their name, literally, in a mountain pass in the Alps

**LONG ANSWER** While that particular breed of dog has never been canonised, many of those four-legged friends have shown saintly behaviour throughout history. The original (and human) Saint Bernard, an Italian monk, founded a hospice in the mid-11th century in the mountain pass that now bears his name.

For offering refuge to travellers on the Great St Bernard Pass, 2,469 metres up the Western Alps on the Swiss-Italian border, Bernard of Menthon was canonised in the 17th century, around the time the dogs appeared at his still-running hospice. From around 1660, the monks kept the breed as companions and watchdogs as they were resistant to the cold. They soon realised the dogs had remarkable senses of direction and smell, so made for ideal rescuers for those lost in the snow.

Over the centuries, the pooches saved thousands of lives, including dozens of Napoleon's soldiers when he marched his army through the pass. One slobbering superhero, Barry, who lived at the hospice from 1800-12, single-paw-edly saved at least 40 people. This breed became known by a number of names – including Barry dogs and Sacred dogs – but Saint Bernard stuck in the 19th century, as they were increasingly bred further afield than that treacherous mountain pass.

## DID YOU KNOW?

**ELEPHANTICIDE**
The book of Maccabees in the Bible recounts how Eleazar Avaran died at the battle of Beit Zechariah in 162 BC after thrusting a spear through the belly of an elephant while underneath. The animal collapsed on top of him.

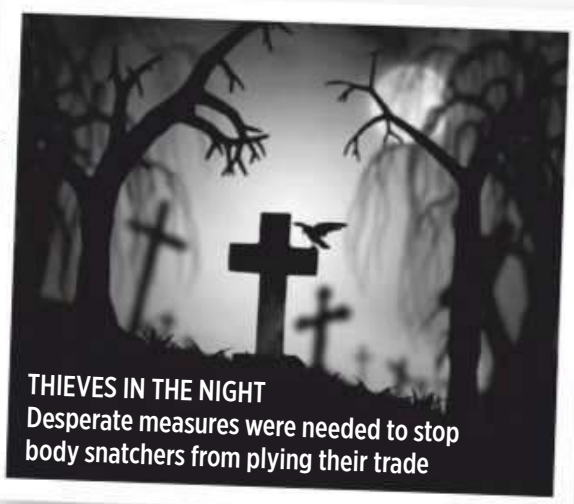
**ARYAN ERROR**
Joseph Goebbels, Minister of Propaganda under Adolf Hitler, selected a snap of six-month-old Hessy Taft for Nazi publications as the "perfect Aryan". Her parents had to keep the secret that the girl was actually Jewish.

**SMEAR TACTICS**
During the 17th-century Civil Wars, royalist Sir Horatio Cary led a horse regiment flying a flag bearing the words, "Come out you cuckold", in reference to parliamentarian Robert Devereux and his marriage problems.

**NAMING NESSIE**
The ornithologist and conservationist Sir Peter Scott proposed the name *Nessiteras rhombopteryx* for the Loch Ness Monster in the 1970s, before it was realised that it was an anagram for "Monster hoax by Sir Peter S".

# What was a coffin collar?

**SHORT ANSWER** Nothing says 'Rest in Peace' like being shackled to the coffin



THIEVES IN THE NIGHT
Desperate measures were needed to stop body snatchers from plying their trade

**LONG ANSWER** Body snatching used to be an endemic crime trade in Britain. Before the Anatomy Act of 1832, the only way for medical institutions to get hold of bodies for anatomical study was from executed criminals – legally. As demand far outstripped supply, the grisly business of digging up recently buried bodies and selling them to hospitals and schools thrived.

The problem was so prevalent that mourners had to take extra measures to ensure their loved ones could rest in peace. The coffin collar was exactly what it sounds like: a metal ring fixed around the neck of the deceased so that the body could not be dragged out by thieving 'resurrectionists'. Among the other devices were iron caskets; mortsafes, metal cages around the coffins; mort houses, or locked buildings to store the dead until they weren't as fresh; and spring-loaded muskets on a trip-wire to prevent unwanted sneaking around cemeteries.

# Where was mini-golf invented?

**SHORT ANSWER** Just like its parent game, mini-golf is likely Scottish too

**LONG ANSWER** A contender hitting well below par to be the inaugural mini-golf course is The Ladies' Putting Club at St Andrews, Scotland. The women-only enterprise was formed in 1867 so they could enjoy the game without infringing on the caddies' space and out of public view.

The sport really began to grow – although not necessarily literally – in the 20th century. The man most often credited with taking the idea national was Garnet Carter, who built thousands of so-called 'Tom Thumb courses' across the US.

**BONCE, TWICE, THRICE**
There have actually been three incarnations of the famous stone heads

**67**
The number of people living in 11 one-room houses on a single courtyard in industrial Birmingham, according to the 1851 census.

# Who are those stone heads in Oxford?

**SHORT ANSWER** Just because they are called the 'emperors' it doesn't mean they come from real empires

**LONG ANSWER** Walk down Broad Street in Oxford and in front of the Sheldonian Theatre and History of Science Museum you'll see 17 stone heads grinning and gurning back at you. Go there around the end of term and there'll invariably be a traffic cone on at least one.

They don't depict old dons or alumni of the university. They don't actually depict anyone at all. Known as the Emperors' Heads, or the Philosophers, they were commissioned by Sir Christopher Wren (of St Paul's Cathedral fame) in the 1660s and carved by William Byrd or, at least, the original set was.

Today's heads are the third set, carved by Michael Black in the 1970s after erosion caused the older emperors to lose their personalities. Heads from the previous two generations have been found all over Oxford, including in private gardens, and the hunt is still on to locate the rest.

# Where could women first vote?

**SHORT ANSWER** For many, women's suffrage was a 20th-century victory – not for New Zealand

**LONG ANSWER** Britain marked the centenary of (some) women gaining the right to vote in 2018, and it won't be until 2029 before 100 years of British women exercising the same voting rights as men can be celebrated. On the other side of the world, however, women won their right to vote several decades before the likes of Emmeline Pankhurst and the Suffragettes.

In 1893, New Zealand became the first self-governing country to extend the suffrage to women following years of campaigning, under the influential leadership of Kate Sheppard. The Christchurch-based activist organised petitions, held meetings and edited the first women-operated newspaper, *The White Ribbon*.

The women of New Zealand demonstrated their democratic right later that year, and one woman, Elizabeth Yates, was also elected as mayor of Onehunga.

Sheppard (*second from left*) appears on a Christchurch suffrage memorial

**PAIN COURSE**
An 1812 artwork by Richard Westall depicts the banquet Dionysius arranged for his courtier

# What was the Sword of Damocles?

**SHORT ANSWER** An ancient ruler hoped the obsequious Damocles would get the point, as it were

**LONG ANSWER** American president John F Kennedy famously spoke of a "nuclear Sword of Damocles" hanging over the world during the Cold War, referring to an impending doom threatening to strike at any moment – and keeping alive an ancient parable. According to legend, Dionysius, a fourth-century BC tyrant of the Sicilian city state of Syracuse, lived in constant fear of losing his power and wealth. So when a sycophantic courtier, Damocles, remarked on how happy he must be, the ruler decided to give a lesson in the struggles that he faced.

Dionysius offered to switch places temporarily with Damocles, and let him attend a lavish banquet and sit on a throne. Damocles's pleasure was short-lived, however, as he noticed a sword above his head hanging from a single horsehair.

The lesson was well learned and would become a popular parable thanks to the Roman statesman and orator Cicero, who recounted the story in his 45 BC work, *Tusculan Disputations*.

GETTY IMAGES X4, ALAMY X3

**AMONG THE RUINS**
Tsutomu Yamaguchi (*inset*) survived the attacks on Hiroshima (*main*) and Nagasaki

# Did anyone survive both atomic bombs?

**SHORT ANSWER** More than you may think, but only one has been officially recognised as being doubly unlucky

**LONG ANSWER** On 6 August 1945, Tsutomu Yamaguchi was in Hiroshima on business at the moment the first atomic bomb was used in war. A US bomber, Enola Gay, dropped 'Little Boy' on the Japanese city, resulting in the deaths of as many as 140,000 people. The 29 year old engineer was not one of them.

Yamaguchi survived despite being two miles from ground zero, although he suffered severe burns, ruptured eardrums and temporary blindness. He boarded a train yes, the trains from Hiroshima were still somehow running bound for his home town: Nagasaki.

Three days after the first mushroom cloud, on 9 August, a heavily bandaged Yamaguchi was describing his experience to his colleagues when the second bomb, Fat Man, was dropped on Nagasaki. As many as 80,000 perished, but again, not Yamaguchi. That said, the double dose of radiation caused his hair to fall out and a week of constant vomiting.

He was not alone in being doubly unlucky. It is thought around 165 people travelled from Hiroshima to Nagasaki in those three days. Yet only Yamaguchi has been officially recognised by the Japanese government as *nijyuu hibakusha* (a twice bombed person). He died in 2010, aged 93.

# Are the kings in a deck of cards based on real kings?

**SHORT ANSWER** Ok, cards on the table: no, they're not. Unless you count one regal deck from France

**LONG ANSWER** A playing card would make for an unusual royal portrait, yet an enduring one always able to raise a cheer if drawn at the right moment. Maybe that was the thinking behind the deck design first seen in late 16th century France, which designated the kings as real rulers from history. Spades was David, the Biblical king of Israel; Hearts was Charlemagne, the first Holy Roman Emperor; Clubs belonged to Alexander the Great; and Diamonds depicted a Roman, either Augustus or Julius Caesar. Don't look too closely at a modern deck for any clues, however, as the idea never caught on.

**4K IMAGE**
Playing card kings don't depict real rulers

# What is the origin of 'nostalgia'?

**SHORT ANSWER**

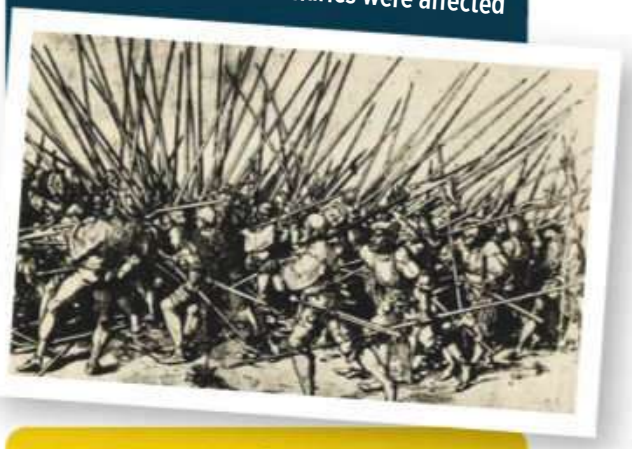
Aaaah, remember the origins of nostalgia, when it was a much-maligned disease?

**LONG ANSWER** Today, the word 'nostalgia' refers to a sentimental affection or longing of times past. When a medical student named Johannes Hofer came up with the term in 1688, though, he meant it as a diagnosable disease.

Nostalgia was an acute homesickness experienced by Swiss mercenary soldiers serving abroad, described by Hofer as "the pain a sick person feels because he is not in his native land, or fears never to see it again". Symptoms included loss of appetite, brain fever and even hallucinations. It was so serious that a favourite milking song, 'Khue-Reyen', was banned and punishable by death for fear of it causing an outbreak.

The condition was not confined to the Swiss, and treatments were unforgiving. Russian 'nostalgics' were threatened with being buried alive, while US doctors suggested bullying it out of afflicted patients.

**FEARSOME WORRIERS**
Even tough Swiss mercenaries were affected



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ONE TO WATCH

Carey Mulligan, Ralph Fiennes (*main*), Johnny Flynn and Archie Barnes (*below*) tell the story behind one of Britain's most important archaeological discoveries

NETFLIX X2

# What lies beneath

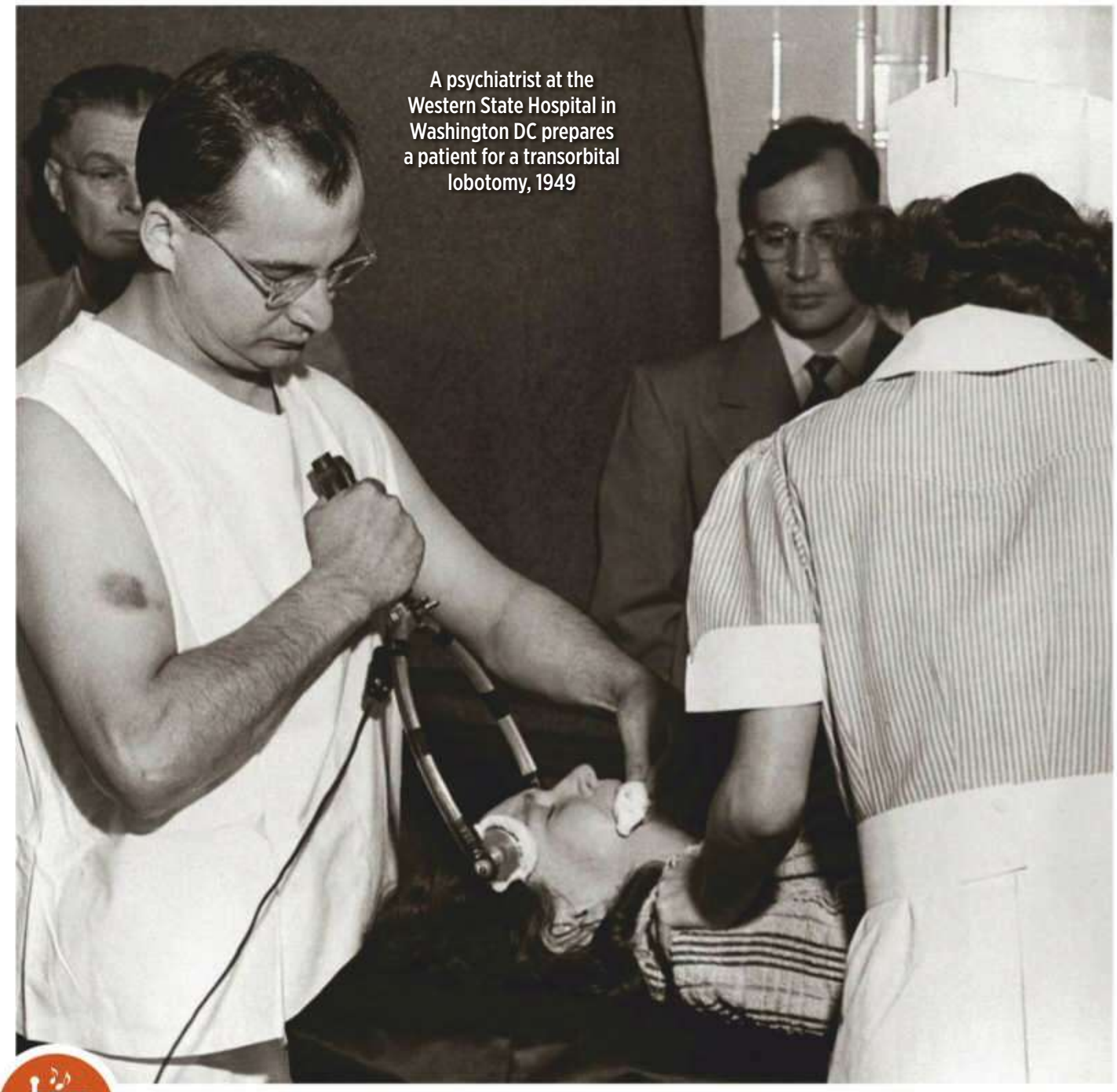
**The Dig** / on limited cinema release, then streaming on Netflix from Friday 29 January

The discovery, in 1939, of a lavish Anglo-Saxon burial at Sutton Hoo remains one of the most extraordinary archaeological discoveries ever made in the UK. Here, in Suffolk countryside, was uncovered the ghostly outline of a ship, preserved even though most of the original timber had long since rotted away. There were also artefacts of such magnificence that it's long been supposed this must have been a royal grave, perhaps that of King Rædwald of East Anglia (c599–c624).

But how did archaeologists come to be working at the site? It's a story retold by director Simon Stone, albeit with no little dramatic licence, in *The Dig*, which begins with well-to-do Edith Pretty (Carey Mulligan) employing Basil Brown (Ralph Fiennes) to excavate the strange mounds that dot part of her land. As the country heads towards an uncertain future, the self-taught Brown digs down into the earth for the princely sum of £2 per week.

In itself, there would probably be enough tension in this scenario to make a passable film, but *The Dig* is rather more than this. With a script by *Harlots* co-creator Moira Buffini (working from a 2007 novel by John Preston), it's a drama that richly conjures up summer days when, with war clouds gathering, there's an acute and pervading sense of people realising they need to make the most of the present. That's especially true of the younger generation, portrayed in the cast by Lily James of *Downton Abbey* fame and Johnny Flynn.

That's not to say *The Dig* is a straightforward feel-good movie. Rather, as with Mackenzie Crook's *Detectorists*, albeit from a very different angle, there's a sense of the past anchoring those who take the time to try to look back. A sense of Britain, England especially, as being hidebound by its class-ridden society adds grit. In all the best ways, a lovely film.



A psychiatrist at the Western State Hospital in Washington DC prepares a patient for a transorbital lobotomy, 1949

# The unkindest cut?

## Archive on Four: Easier than Curing a Toothache? The Story of Lobotomy / BBC Radio 4, scheduled for Saturday 30 January

Today, the idea of a doctor conducting a lobotomy, severing connections in the brain's prefrontal cortex, horrifies us. Yet when doctors first began conducting this procedure, around the middle of the 20th century, they acted with the best of intentions as they sought to treat conditions such as schizophrenia, depression and obsessive-compulsive disorder.

Sadly, the results of the treatment were at best mixed. While some patients had their lives transformed for the better by, to use the description employed by American surgeon Dr Walter Freeman, their worries being cut out, others were not so lucky. Research conducted in the 1950s and 1960s suggested that around a third of patients were left worse off than before, some in a piteous state. Those who suffered included John F Kennedy's sister, Rose (1918–2005), who was subsequently hidden away in an institution by her family..

Despite such failures, thousands were lobotomised. In the UK, doctors were especially keen on the procedure and, proportionately, more people were lobotomised than in the US. Eventually, thanks to a combination of new psychoactive drugs being introduced and evidence of poor results, lobotomy eventually fell out of favour, but how and why did its use ever become so widespread?.

It's a question journalist Claire Prentice explores in a one-off documentary with the help of the archives. She uncovers the story of a procedure with roots in idealistic medics wanting to free people from mental hospitals, and yet which has become synonymous in popular culture, notably via Ken Kesey's *One Flew Over the Cuckoo's Nest* and its film adaptation, with sadistic malpractice.

A surgeon performs a lobotomy on a patient in 1946. The procedure was once a mainstream part of psychiatry in the UK

GETTY IMAGES X7, BBC X1

## Intimate histories

### Faith, Hope and Glory / BBC Radio 4, from Monday 8 February

In the years since the Second World War, the United Kingdom has become an increasingly multicultural society. It's a story often portrayed in terms of the country's wider geopolitical and cultural history, and yet it's also a story we need to see rather less grandly, in the domestic terms of day-to-day lives.

That's the approach taken in a new strand from BBC Radio 4 that will run up until 2028. The first five weekday shows tell the story of how, in 1946, Hope and Jim's baby is entrusted to Faith (played by Shiloh Coke, *pictured*) to take home to Antigua. But the child is lost at Tilbury Docks and found by Gloria and Clement, a celibate couple who decide to keep a baby they name Joy. In subsequent series, the drama will play out over the years of Joy's life.

Rembrandt's 1632 depiction of an anatomy lesson (*main*) and Leonardo da Vinci's sketches (*inset*) offer unique glimpses into the history of medicine

# Home front heroes

## **Blitz Spirit with Lucy Worsley** / BBC One, scheduled for late February

On 7 September 1940, German bombers launched an attack on London. For the next eight months, the Luftwaffe, which had hitherto concentrated on trying to defeat the RAF and establish air control over Britain's skies, would pummel the country's cities, ports and industrial infrastructure. The Blitz had begun.

For the ordinary Britons forced to take cover in Anderson shelters or sleep in London's Tube stations, this was a terrifying new form of warfare where civilians were on the frontline. Nearly 50,000 people lost their lives, many buried beneath rubble, and yet, rather than buckle, people pulled together. Far from breaking the country, this was the making of a nation that grew more determined than ever to prevail – at least if we're to believe our national myth.

The notion of 'Blitz spirit', which has come to mean a stoic determination to endure and to make the best of a bad situation, entered the national lexicon. But what was life really like for those who endured the attacks? Ever one to poke a stick at half-truths, as her *Biggest Fibs* shows have lately shown, Lucy Worsley explores the experiences of Britons during the Blitz.

Produced by the same team that made *Suffragettes with Lucy Worsley*, *Blitz Spirit* draws on sources such as biographies, oral history collections and private diaries to tell its story. The experiences of women are front and centre, reflecting how so many volunteered to work in key Civil Defence roles as ARP wardens, stretcher bearers and nurses, serving in roles that had often previously been closed to them.

Lucy Worsley (*left*) examines how Britons were quite literally forced to pick up the pieces (*above*) when German bombs started falling

# Matters corporeal

## **Bodies** / BBC Radio 4 & BBC Sounds, from Monday 18 January

To think and talk about the human body, says Professor Alice Roberts, is to find some of our most fundamental notions about the world coming into focus. In particular, it's to become aware of how we frame ideas in terms of opposites: material and immaterial, invisible and visible, mind and body, *body and soul*.

It follows that our changing understanding of anatomy down the centuries has altered our own conception of who we are, a theme Roberts explores in a new 10-part weekday series that naturally lends itself to podcast-style listening.

It's a narrative that looks back to the prehistoric era: did our ancestors see the human body as similar to those of the animals they hunted? In other episodes, Roberts also wonders how the Egyptians gained their anatomical knowledge (via the battlefield or embalming rites?), and looks at Greek beliefs about the ideal body.

There's much on the history of dissection, which so fascinated Leonardo da Vinci that he claimed to have examined more than 30 bodies.

▶▶ *Turn to page 26 for our essential guide to the history of medicine*

## Unlikely partners

### Archive on 4: Alliance / BBC Radio 4 & BBC Sounds, from Saturday 23 January

There are strong parallels between the lives of former Hollywood actor-turned-politician Ronald Reagan and Pope John Paul II (*pictured*). Both came from modest backgrounds, both were athletic as younger men and both survived assassination attempts in 1981. Importantly, in the context of the final days of Cold War, the duo also shared a loathing of communism and a deep-seated fear about the possibility of nuclear war. Presented by Jane Little, this documentary looks at how the two men bonded the extent to which they worked together against the Soviet Union.

# EVENTS & EXHIBITIONS

WHAT TO SEE AND WHERE TO VISIT IN THE WIDER WORLD OF HISTORY

## EXPERIENCING HISTORY

Museums and historical spaces are continuing to reopen their doors in many areas of Britain, but there is still plenty of history to be enjoyed online

MUST SEE

Just a few of the exquisite finds in the Galloway hoard, including brooches and an enamelled cross

Ornate glass beads were found among the Viking-era treasure

# The Galloway Hoard: Viking-Age Treasure

EXHIBITION

NATIONAL MUSEUM OF SCOTLAND

FREE ENTRY Edinburgh, 19 February – 9 May, *nms.ac.uk*

The Galloway Hoard is undoubtedly one of the most important Viking era finds ever discovered in Britain. Unearthed by a metal detectorist in south west Scotland in September 2014, the 10th century treasure trove is now going on public display in Edinburgh following several years of archaeological analysis.

Made up of more than 100 items including amulets, brooches, arm rings and a unique, bird shaped pin the hoard is particularly significant because it contains a wide variety of Viking era objects, rather than just one single type of artefact.

Crucially, it also boasts rare surviving examples of textiles from the period (such as silk, wool and leather), plus a decorated silver gilt vessel that is, to date, the only complete one of its kind to be discovered in Britain and Ireland.

As well as the chance to see the recently cleaned and conserved objects up close, visitors to the exhibition can delve deeper and examine hidden details found in X rays, CT scans and 3D models.

The display also explores the wider context of the period in which the hoard was buried an age in which the political entities we now know as Scotland, England and Ireland were beginning to form.

Entry to the exhibition is free, but a timed entry ticket (which also gives access to the rest of the museum) must be booked in advance.

Once it has finished its stint at the National Museum of Scotland, the display will go on tour to Kirkcudbright Galleries in Dumfries and Galloway, followed by Aberdeen Art Gallery.

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Satirical cartoons played down the horrors of the pandemic

ONLINE TALK

# Public Health and the 1918–19 Influenza Pandemic

FREE THE NATIONAL ARCHIVES

19 February, *bit.ly/publichealth_influenza*

As World War I was coming to an end, another disaster was looming and one that would ultimately claim more lives. In total, the so called Spanish Flu pandemic is believed to have killed at least 50 million people across the globe between 1918 19. Although no deadlier in Spain, the pandemic earned its colloquial name because the nation's lack of media censorship meant that cases there were more heavily reported.

In a special online talk hosted by the National Archives, health records specialist Laura Robson Mainwaring will be discussing the British government's response to the outbreak, as well as other insights that can be gleaned from the rich primary sources held at the repository.

ONLINE TALK

## A POISONOUS METHOD

PAID SURGEONS' HALL MUSEUMS

25 January, 22 February and 29 March, *museum.rcsed.ac.uk*

Poison was the Victorian murderer's weapon of choice. In an age where a whole arsenal of toxins could be purchased over the shop counter, its proponents included some of the worst serial killers of the 19th century – such as Mary Ann Cotton, who is thought to have poisoned up to 21 people.

Over the coming months, Surgeons' Hall Museums in Edinburgh will host a trio of online talks, each focusing on the history of a different poison and its use in real crimes. The series kicks off with arsenic on 25 January, before covering opium on 22 February and acid on 29 March.

Tickets for each talk are priced £2.74 and must be booked separately. If you miss a session, a recorded version will be available to stream for seven days after it has taken place.

## UNFINISHED BUSINESS: THE FIGHT FOR WOMEN'S RIGHTS

THE BRITISH LIBRARY

EXHIBITION

PAID ENTRY Until 21 February, *bit.ly/unfinished_business_bl*

Nearly a century has passed since universal suffrage was achieved in the UK, but the fight for female equality is still far from over. From campaigns to increase the number of women in science and engineering roles, to tackling the problem of period poverty, modern feminist activism encompasses an incredibly diverse range of issues. This landmark British Library exhibition explores the parallels between 21st-century campaigns and those throughout history, revealing how women and their allies have fought with passion, imagination and tenacity. Tickets are £15 and must be booked in advance.

The exhibition showcases a wide selection of handmade protest banners, each representing different UK feminist organisations

The Royal College of Physicians holds masses of historic medical literature

## RCP Unseen

ONLINE EXHIBITION

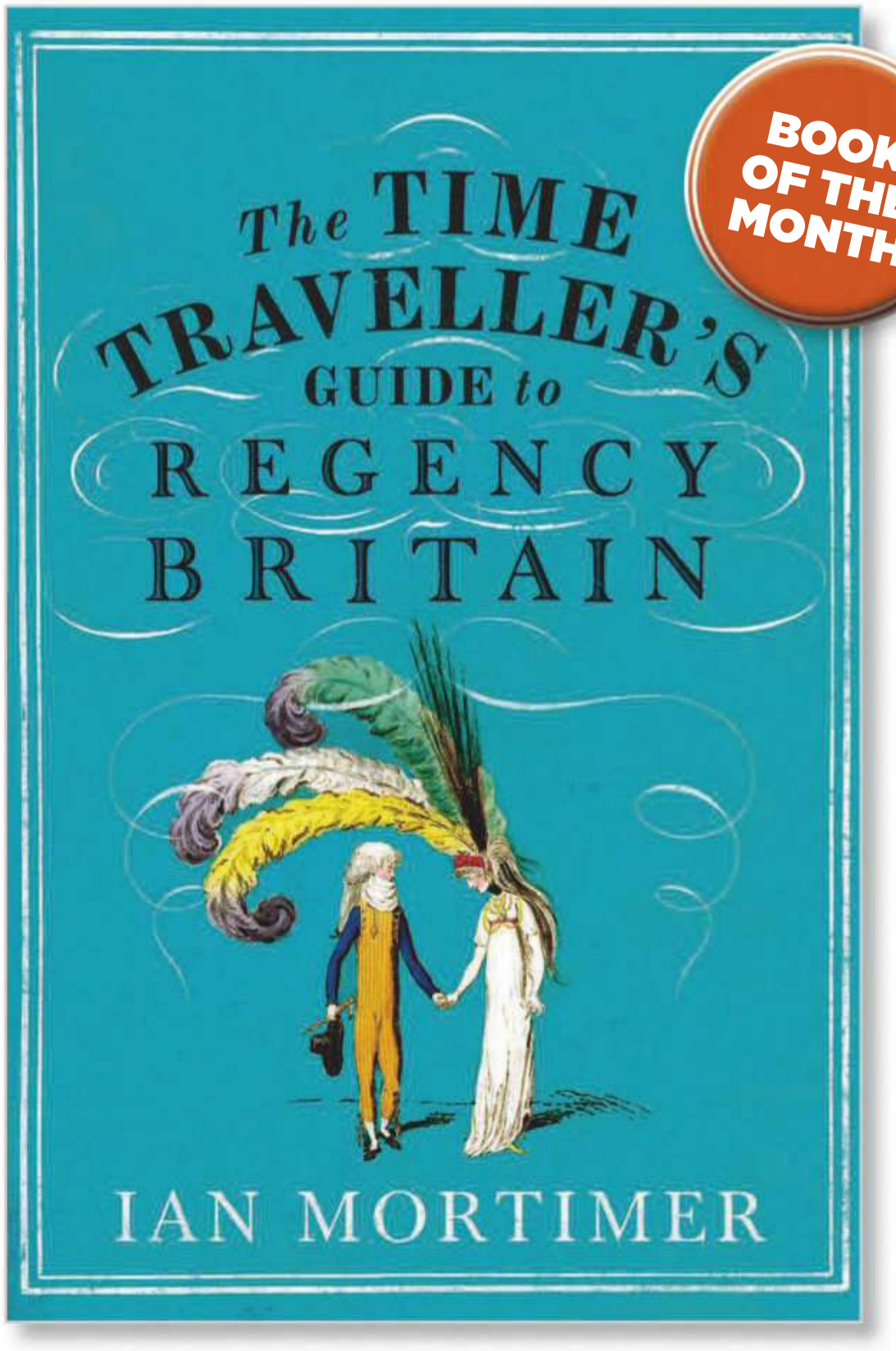
THE ROYAL COLLEGE OF PHYSICIANS

From 18 January, *history.rcplondon.ac.uk*

Founded by Henry VIII, the Royal College of Physicians is home to an abundance of rare objects, records and books spanning 500 years of medical history. And now, thanks to a new online exhibition, people can explore the college's most fascinating items from home. Highlights include surgical devices through the ages, plus a series of 'medical tables' – teaching aids comprising real human nerves, veins and arteries mounted on varnished panels. A physical version of the exhibition is planned once the college museum (currently closed due to Covid 19 restrictions) reopens – check the website for details.

# BOOKS & PODCASTS

THIS MONTH'S BEST HISTORICAL READS AND LISTENS




BOOK OF THE MONTH

## The Time Traveller's Guide to Regency Britain

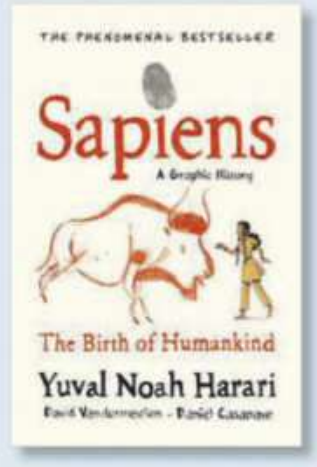
**By Ian Mortimer**
**Bodley Head, £20, hardback, 432 pages**

Following previous stops in the medieval, Elizabethan and Restoration periods, Ian Mortimer's book series reaches the Regency era the late Georgian period here defined as stretching from 1789 to 1830. From the Industrial Revolution to the death of George IV via Austen, Byron and Constable, it's a short span of time packed with great cultural achievement. It was also a period of war, at Waterloo and Trafalgar, and increasing division between rich and poor. Mortimer's accessible guidebook format brings these contradictions vividly to life.

## Sapiens, A Graphic History: The Birth of Humankind

**By Yuval Noah Harari**
**Jonathan Cape, £18.99, hardback, 248 pages**

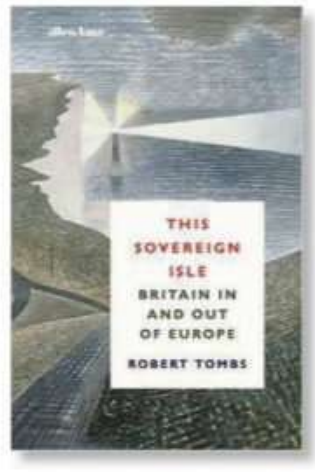
Yuval Noah Harari's *Sapiens*, which charts the story of human development from the Stone Age to the present day, achieved mainstream success when it was published in English in 2014. Seven years on, it's being packaged in a new form: a series of graphic novels perfect for younger readers. This first volume, one of four planned, is filled with lively characters – including Harari himself.




## This Sovereign Isle: Britain In and Out of Europe

**By Robert Tombs**
**Allen Lane, £16.99, hardback, 224 pages**

By the time you read this, the 12 month Brexit transition period will be over and the UK will, one way or another, have a different place in the world. If you're eager to understand the wider context of Brexit, this slim, sober book is a great place to start: it suggests that Britain's drift from the European Union can be explained by the different historical experiences of the two, as well as its links to other parts of the world.



## War: How Conflict Shaped Us

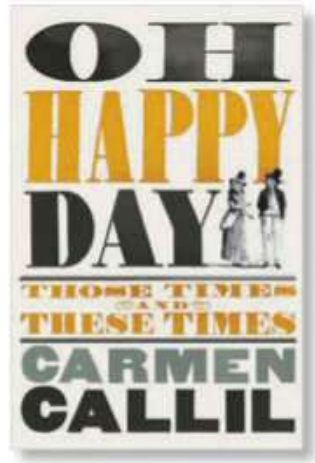
**By Margaret MacMillan**
**Profile Books, £20, hardback, 336 pages**

If you're a fan of big picture, argument driven histories, this is one for you. With characteristic skill, Margaret MacMillan explores how conflict has shaped civilisation across thousands of years, from culture and society to politics and industry. It's not accurate, she suggests, to see warfare as an outlier, or to restrict it to its own corner of the historical arena only by understanding brutal hostilities can we make sense of the full range of the human experience. Fascinating stuff.

## Empireland: How Imperialism Has Shaped Modern Britain

**By Sathnam Sanghera**
**Viking, £18.99, hardback, 320 pages**

The British Empire shaped Britain just as much as it did its subjects elsewhere in the world. That's the central tenet of this book, which highlights how the past manifests itself today. It's a tough topic, but Sathnam Sanghera is engaging company, surveying the way in which imperialism has influenced everything from the birth of the NHS to how the UK has tackled the coronavirus pandemic.




## Oh Happy Day: Those Times and These Times

**By Carmen Callil**
**Jonathan Cape, £18.99, hardback, 368 pages**

In this poignant mixture of the personal and the political, writer Carmen Callil interweaves the stories of her ancestors and explores what they tell us about the times in which they lived. Supplementing a meagre living as labourers in the Midlands with a life of crime, some of Callil's forebears were transported to Australia where both brutality and prosperity beckoned. Sketching parallels between the 19th century and today, and highlighting the injustices experienced by society's poorest members, this is a stirring, opinionated account.

# HistoryExtra Podcast

**Each month we bring you three of our favourite interviews from the HistoryExtra podcast archives...**

## THIS MONTH... three podcasts on the history of science

Visit historyextra.com/podcast for new podcasts every week

### Medieval science

**bit.ly/MedievalPod91**

Although we often think of science as a product of the Enlightenment era, our medieval forebears were actually surprisingly sophisticated scientists. So argues historian and author Seb Falk in this 2020 interview, which throws the spotlight on the theories, individuals and instruments that helped produce a better picture of the world in the so-called 'Dark Ages'.

### Attenborough on Darwin

**bit.ly/AttenboroughPod91**

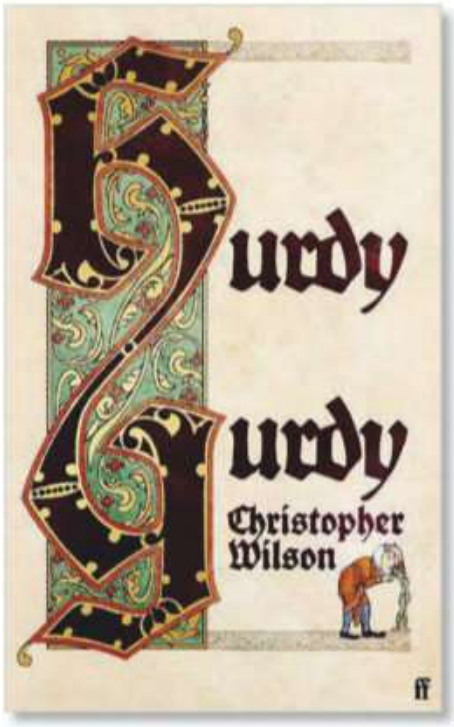
This is an oldie but a goodie, as naturalist and broadcaster David Attenborough shares his love of 19th century geologist and botanist Charles Darwin probably one of history's most famous, and most influential, scientists. Podcasts have come a long way since this episode was produced in 2009, but it's worth sticking with to hear the thoughts of a genuine national treasure.

### Science and suffrage

**bit.ly/SuffragePod91**

The history of science was long dominated by men but the upheaval of the First World War and the efforts of suffrage campaigners meant that the early 20th century offered new professional opportunities for women. In this 2018 interview, historian Patricia Fara explores the challenges faced by female scientists in the period, and the reasons that their stories are so often still forgotten.

# HISTORICAL FICTION....




## Hurdy Gurdy

**By Christopher Wilson**
**Faber & Faber, £14.99**

In the year 1349, England is being ravaged by plague and thousands of people are lying dead in its wake. A 16 year old novice friar, Brother Diggory, is chosen to take on the terrifying task of tending to the afflicted without the knowledge to help him. Nobody can make sense of this sickness and the Church, doctors and authorities are all helpless to stop it. Diggory soon comes to realise that this challenge will be unlike anything he's encountered before and that living through an illness is very different from understanding it.

## Excerpt

*Brother Diggory begins to tell his story...*

When I died the first time, the Good Lord took pity on my boy's frail sparrow frame, caught the fleeing beat of my heart, and blew the breath back into my still-warm body. Then he laid me back into this nest of life, like some tumbled, trampled hatchling, shivering, squawking and ruffle-feathered, judging my death was come too soon, that I still had use, and had to live, learn and suffer more.

This was in the season of the plague, in the twenty-first year of Our Lord King Edward, Long-Hair, the Great Unbuttoned – may God preserve him – who loves his peoples sorely, especially the women.

The world was younger then, still raw. The edges of our Earth had not been mapped, and many oceans and continents remained unknown to folk. The colours were sharp, freshly daubed by His Divine brush, and the sounds new as dew, and the feel of things prickled sharp as nettles. And, yes, I pledge on the jeopardy of my immortal soul. I saw it all, with my young eyes. From start to end.

And may Lucifer, and his infernal demons, make a feet-ball of my bonce, a wine-gourd of my bladder, a purse of my scrotum, then pluck my eye-balls for ink-wells, stretch my guts for bow-strings, fry my liver for break-fast, and griddle my guts for all time, if a word of this sorry history turns out to be a lie.

SOPHIA KENNEDY-WILSON

## Q&A
### Christopher Wilson

Christopher Wilson trained as a psychologist, completing his PhD on the psychology of humour at LSE. His work has been adapted for the stage, and he has been listed for the Booker Prize and shortlisted for the Whitbread Fiction Prize.

**Why did you choose to set your novel during the plague of the 14th century?**
I wrote this pre-Covid-19, but changes of climate – atmospheric and political – cast an ominous chill. A drama needs conflict and jeopardy, and a plague provides plenty. It's 1349 and the Black Death is scorching through England. Nothing seems to stop it so folk search for a cure. Maybe potpourri will help, or strapping a plucked, live chicken to your chest, or bathing in urine. A young monk sets out as a plague doctor, but unwittingly carries death with him, from town to town, infecting all those he meets. This is his journey of enlightenment, discovering science, women, sex, sin and virtue en route.

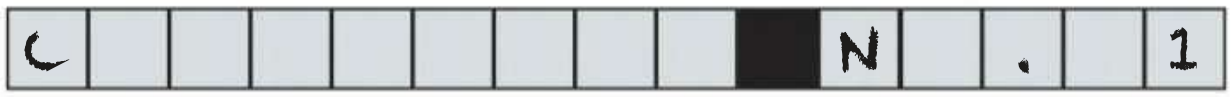
**What is your writing process like?**
My process is intuitive and logical, chaotic and organised. I can't plan a book in advance. It wilts if I know what's going to happen. I have to discover the story as I write. To start, I need a Catherine Wheel of an idea that sends out sparks in all directions. I write fixed hours every day. I don't discuss work-in-progress. But I do sleep on it, and dream about it. You learn to use parts of your mind that your conscious doesn't control.

**What do you enjoy about writing historical fiction?**
There's a delight in researching an entirely new area. It's travel to alternate worlds and a voyeuristic experience of different lives. With *Hurdy Gurdy*, I was entering a God-governed world with perilous, unknown edges, hellfire, purgatory, angels, demons and alchemy. Before that I'd set novels in pre-history, Dickensian London, 1960s Mississippi, fin de siècle Vienna, 19th-century Scandinavia, and Stalin's Russia. When it comes to historical fiction, I've largely specialised in The Human Period.

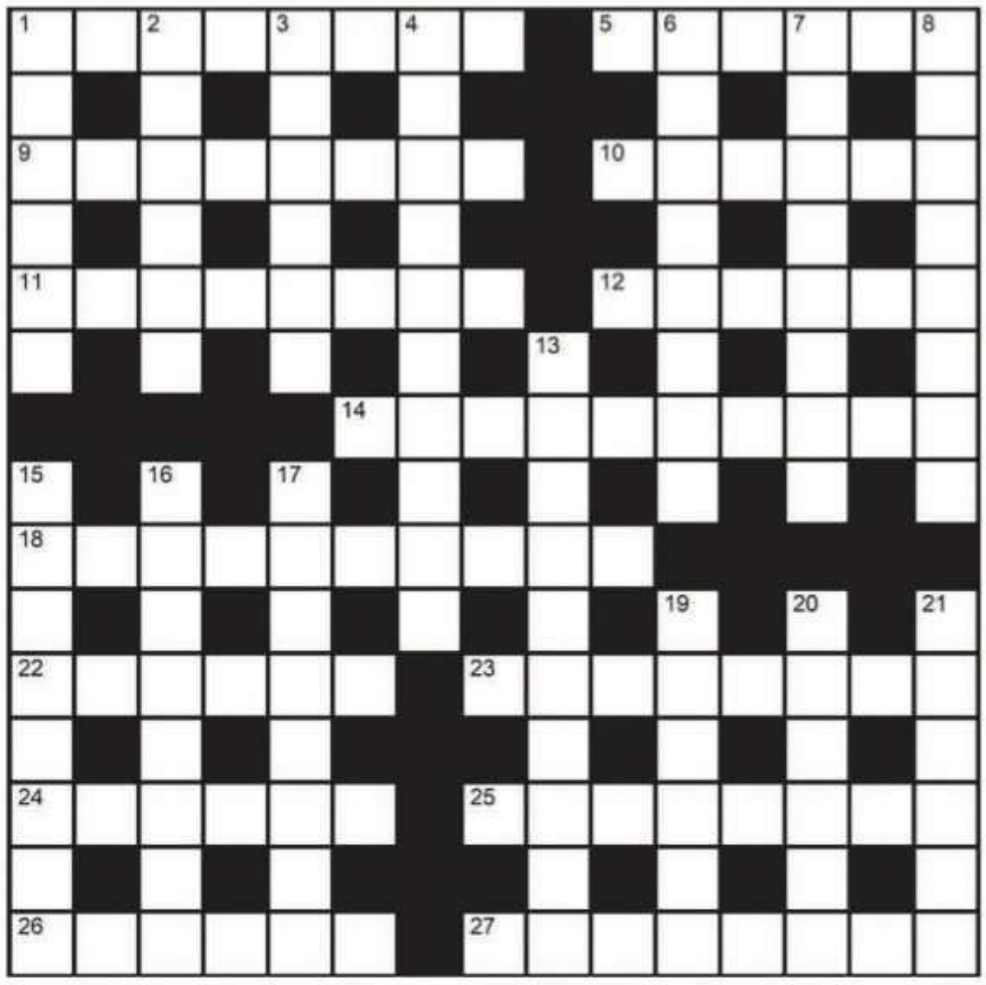
**Have you found any parallels between the medieval and modern periods when it comes to illness?**
Looking at pandemics, you notice parallels between the Black Death and our more recent experience of AIDS and Covid-19. Conspiracy theories flourish to fill the gaps in knowledge. There's always a morality play, too, enacted by a plague. The blind, uncaring bug becomes an avenging moral agent. It's God's punishment for human sin. It's a consequence of promiscuity. It's spread by selfish, inconsiderate behaviour. And in all these pandemics there's been an understandable, initial medical embarrassment in its ignorance of what's going on.

# CROSSWORD

TEST YOURSELF WITH OUR HISTORICAL PUZZLE EVERY ISSUE



## Test your history knowledge to solve our prize puzzle – and you could win a fantastic new book



Set by Richard Smyth

### ACROSS

**1** North Carolina county, noted as the origin of a slang term that could be used for 8 Down (8)
**5** Hamid Karzai or Mohammad Zahir Shah, perhaps (6)
**9** George ___ (1800–53), printer who gave his name to a series of railway guides (8)
**10** Capital of Iran, on the site of the ancient city of Rhages (6)
**11** ___ Front, another name for the Macedonian Front in World War I (8)
**12** Clement ___ (1883–1967), British Prime Minister from 1945 to 1951 (6)
**14** Industrial plant in, for example, Port Talbot or Consett, historically (5,5)
**18** 1945 satirical novel by George Orwell (6,4)
**22** Former class of Royal Navy ships that included the Gnat, Mantis and Moth (6)
**23** 2016 album and film by Beyoncé (8)
**24** City and, for a long time, capital of ancient Egypt (6)
**25** Frederick ___ (d.1895), US abolitionist and writer (8)
**26** Incendiary mix devised by the US military (6)
**27** 1923 comic novel by Aldous Huxley (5,3)

### DOWN

**1** Iran-centric religion founded in Persia in 1844 by `Alí Muhammad Shírází (6)
**2** Anna ___ (1904–86), British stage and film actress, made a Dame in 1969 (6)
**3** Duke in William Shakespeare's *Twelfth Night* (6)
**4** *Boys From The* ___, 1982 Liverpool-set BBC drama (10)
**6** Capital of Sierra Leone, founded in 1792 (8)
**7** The subjects of armorial bearings (8)
**8** ___ verse, poetry form associated with Lewis Carroll and Edward Lear (8)
**13** Capital of Guyana, once known as 'the Garden City of the Caribbean' (10)
**15** Alexander ___ (d.1804), US Founding Father (8)
**16** *The* ___, 1939 detective novel by Raymond Chandler (3,5)
**17** Peter ___ (b.1952), Australian-born human rights campaigner (8)
**19** Boy raised by wolves in Rudyard Kipling's *The Jungle Book* (1894) (6)
**20** Joe ___ (b.1943), New York Jets quarterback, nicknamed 'Broadway Joe' (6)
**21** British Crown dependency, occupied by Germany from 1940 to 1945 (6)

## CHANCE TO WIN

DVD WORTH £9.99 FOR THREE WINNERS

**Arthur & Merlin: Knights of Camelot**

### HOW TO ENTER

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## SOLUTION Nº 89

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# LETTERS

EVERYTHING YOU WANTED TO KNOW ABOUT
THE HOME FRONT
Daniel Todman answers key questions about life in Britain during World War II

WHAT IF RICHARD III HAD WON AT BOSWORTH?
MEDIEVAL MAGIC
BBC
HISTORY REVEALED
YOUR ESSENTIAL GUIDE TO
THE WORLD WAR II HOME FRONT
Explore everyday life in wartime Britain – from blackouts to the Blitz
IN A NUTSHELL
THE ANCIENT GREEK PELOPONNESIAN WAR
PLUS Posters that changed the world
Q&A: Why do lawyers wear wigs?

Readers Judith Hope and Kevin Taylor both disagreed with comments made by historian Daniel Todman in a recent Q&A we published about the World War II home front

## A TROUBLED HISTORY

In Daniel Todman's recent Q&A on the home front (Christmas, 2020) he states that "the idea of the war being a struggle to save Europe's Jews wasn't really there". Whoever thought the war was about the Jews? No one cared enough to wage war to protect Jews!

The piece also claims that there was little sympathy when news of the concentration camps came, perhaps because they were found by the Soviets, not the British. But what about Bergen Belsen? What about the US discoveries of Buchenwald, Dachau and Mauthausen? Pathé News showed footage of the camps in cinemas. Of course people knew!

The bottom line was that Hitler wanted to eliminate the Jews in the course of his occupations, and the Allies wanted to stop Hitler's expansion. However, the Allies didn't want to waste ammunition and aircraft fuel on operations that wouldn't directly benefit their overall aims bombing railway lines to the camps, for example.

Please don't compare the persecution of the Jews to that of non Jewish people in occupied Europe as though they were the same. One was gassing, starvation, medical experiments and being worked to death; the other wasn't bad if you weren't associated with Jews or the underground fighters.

**Judith Hope,** Derbyshire

I was a little taken aback by one of the comments in Daniel Todman's home front Q&A (Christmas 2020), in which he states that "there was very little sympathy when news of the camps did arrive".

I find this comment to be an insult to postwar Britons and the millions murdered by the Nazis. People were shocked when they saw the newsreels in cinemas and appalled by the extent of the Nazi regime's cruelty. I have personally spoken to many people who saw these newsreels and know how distressed they were. I think Daniel Todman is portraying a revisionist history of this aspect of the British home front.

**Kevin Taylor,** Derbyshire

**Daniel Todman replies:**

I'm grateful to readers who felt moved to dispute this point, and I'm sorry if anyone felt that I had set out to insult people in the past. As a historian, I don't see it as my job to defend or insult those I study – just to try to understand them better.

Unfortunately, this does mean exploring attitudes that can be uncomfortable to recognise today. That includes the habitual anti-Semitism that characterised British society in the 1930s and 1940s – and the lack of comprehension among most Britons at the time of what the Holocaust actually involved.

There was widespread anger and disgust at Hitler and the Nazi regime even before the outbreak of war in 1939, and this included horror at the brutality of the Nazi assault on German Jews. Although the British government did not initially emphasise the genocidal nature of Nazi anti-Semitism in its own propaganda, during 1942 shocking details of the annihilatory campaign against Jews were widely reported in the British press, and the government formally recognised that the Nazis were trying to destroy Europe's Jewish population.

Many Britons were appalled – but two things strike the modern researcher. The first is how often this was accompanied by expressions of anti-Jewish prejudice. For example, when the government's Home Intelligence division asked members of the public "How do you feel about the Jews?" in 1942, one man replied: "Abroad – greatest sympathy; in England – general feeling that they badly want controlling."

The second is how quickly the subject faded from the news: hence the widespread sense of revelation at the liberation of Bergen-Belsen in 1945. That sense of shock – at the 'discovery' of what was a concentration rather than a death camp – tells us quite a lot about how little these horrors had impinged on public consciousness over the previous six years. In turn, that helps to explain the anger that was undoubtedly felt against the Germans by those watching the newsreels of the camps that spring. Again, however, going back to the original sources it is striking how little emphasis was put in that reporting on the specificity of Nazi violence against Jews, as opposed to the national identities of those liberated. I agree absolutely that these were different things – but that was not the impression put across to audiences at the time.

And if one looks at late 1940s Britain (a period that included anti-Jewish riots following the murder of British servicemen in Palestine), it is unfortunately hard to argue that the war led to a decisive shift in public attitudes. I agree that during World War II, the overwhelming majority of Britons supported a struggle against what they understood correctly to be an evil enemy. However, I think that the best way of honouring their sacrifices is to face head-on what a complex mix of beliefs underpinned that understanding.

## BLITZ MEMORIES

While reading your essential guide to the home front (Christmas 2020), I recalled some early childhood memories of the Blitz. My father was serving on board HMS *Wolf* in Ceylon at the time, while my mother and I frequently

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travelled between family members in Scotland and the north of England. While staying in Leith, I remember once hearing a loud explosion during the night and seeing the fireplace lying face down on the floor. Meanwhile, all of the nearby shops had their windows broken, with their contents spread out all over the street.

As a child I also recall seeing building damage at Anchorfield, between Leith and Newhaven, along with another area of destruction near Cooper Street School, close to Leith Library. When I was older I used to play on the bomb sites until they were cleared after the war had ended.

I was later told that a string of land mines had been dropped in a line from Granton Harbour to Portobello in order to knock out the railway running from Portland Place, Leith, to the Caledonian Hotel in Edinburgh's West End, as well as the Henry Robb Shipyard at Leith Docks.

**David Niven,** by email

## CROSSWORD WINNERS

The three lucky winners of the crossword from issue 88 are:

**R Fraser, Ross-shire**
**M Walsh, Cheshire**
**A Anderson, Gwynedd**

Congratulations! You've each won a DVD copy of *Babylon Berlin*

Please note, there will be a delay in posting your prize due to the Covid-19 pandemic.


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# PHOTO FINISH

ARRESTING IMAGES FROM THE ANNALS OF THE PAST

## ROBERTA COWELL 1954

Racing driver and WWII Spitfire pilot Roberta Cowell was the first known person in Britain to undergo gender reassignment surgery. Struggling with depression and trauma, Cowell (born in 1918) had an operation to remove her testicles – an illegal procedure in the UK at the time but one which allowed Cowell to state that she was intersex, and therefore alter the sex on her birth certificate to female. The operation was carried out by physician Michael Dillon, himself the first trans person to undergo phalloplasty surgery, and in 1951, Sir Harold Gillies – widely considered the father of plastic surgery – successfully performed a vaginoplasty procedure on Cowell, the first of its kind in Britain. In an interview with *The Sunday Times* in 1972, Cowell stated that her gender reassignment was justifiable because she had been born with a chromosomal abnormality known as XX male syndrome. Despite her pioneering surgery, Cowell was not a champion of the transgender community as a whole, though, and had little sympathy for individuals with XY chromosomes who underwent gender reassignment.

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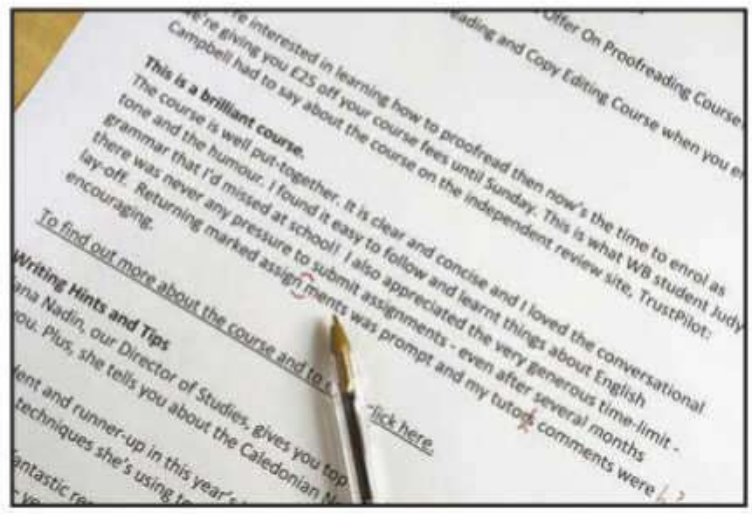


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